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GEOGRAPHIC INEQUALITIES IN
PROPERTY TAX LEVELS

A Study of the Urban Municipalities

in

The Edmonton Regional Planning District

by



JOHN MARTIN

A THESIS

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The undersigned certify that they have read, and recommend to
the Faculty of Graduate Studies for acceptance, a thesis entitled
Geographic Inequalities in Property Tax Levels submitted by John
Martin in partial fulfillment of the requirements for the degree of
Master of Arts.

Date July 8, 1971.



ABSTRACT

Much concern has been expressed over the rapid growth rates displayed by the two major metropolitan centres in the Province of Alberta--Edmonton and Calgary. Extensive interest has been shown to implement policies which would control the growth of these centres. One such policy is to promote the growth of existing urban centres located within commuting distance of the metropolitan areas. Most of these municipalities would require an extensive upgrading of their existing community facilities; additional sewage, water and utility lines, roads, schools, hospitals, libraries and related projects would be needed to service the proposed population growth.

The results of the present study indicate that a program for promoting the growth of these commuting centres should consider the impact of this development on local property tax levels. The findings show that high property tax levels will restrict the growth of certain municipalities in the Edmonton area due to two main conditions:

1. municipalities which are currently characterized by high property tax levels cannot afford to upgrade their existing facilities since this would require an increase in their property taxes
2. high property taxes discourage the formation of new residential, commercial, and industrial growth which creates a stagnant or declining property tax base

The urban municipalities having high property tax levels are not capable of solving their financial problems without aid from the senior

governments. A successful program for developing these urban centers would have to include some provisions whereby sufficient funds may be made available to improve their existing community facilities without increasing local property taxes or creating higher municipal debts.

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INTRODUCTION

The purpose of this study is to examine the property tax structure of the urban municipalities in the Edmonton Regional Planning District. The initial objective is to study the spatial variations in the levels of property taxation for these municipalities. Subsequent sections examine the community characteristics which are associated with local property tax levels. The final objective is to determine which factors offer the best explanation for the variations in the levels of property taxation.

The research topic originated from two basic conditions faced by urban governments:

1. Recent patterns of population growth, along with greater expectations and demands of this population, have necessitated increased expenditures for municipal services.
2. The taxation of real property is the main source of revenue available to local governments to finance these projects.

Similar concerns were also registered in a recent article submitted by the Canadian Federation of Mayors and Municipalities, which stated:

"The requirements of the multiplying numbers of the urban population for educational services, welfare services, hospitals, roads, water and sanitary facilities, etc. have placed a severe financial strain upon the principal source of municipal revenues--the tax on real property."¹

¹Canadian Federation of Mayors and Municipalities, Submission to

Recent population and property taxation patterns in the Province of Alberta provide ideal conditions for a study of this nature. Table A indicates that the province has been characterized by rapid increases in the number of people residing in the urban municipalities.² The percentage of the total population residing in these centres advanced from 67.5 per cent in 1961 to nearly 75 per cent in 1969.³ The major population growth has occurred in the cities; the total population registered in the towns and villages actually shows a slight decline.

Table B indicates that the amount of revenue obtained from real property taxation has risen dramatically. The major increase has occurred for the cities. A second item to be noted is that property taxes have increased at a much faster rate than the population growths.

METHODOLOGY

Geographic Approach

Andrew H. Clark in Geographical Diversity and The Personality of Canada, describes the geographic framework as follows:

Perhaps the simplest definition of the task of the geographer is that he has the responsibility to describe and explain 'what other places are like'. Many places, and by extension, many areas,

the Federal-Provincial Tax Structure Committee, Montreal, 1966, p. 20.

²The urban municipalities consist of Cities, Towns, Villages, and Summer Villages. The rural municipalities include Municipal Districts, Counties, Improvement Districts, and Special Areas.

³The latest population figures (1971) show that the Province of Alberta has 75.3 per cent of the total population residing in the urban municipalities.

TABLE A

POPULATION GROWTH
BY URBAN MUNICIPALITIES IN
THE PROVINCE OF ALBERTA, 1961 AND 1969

Urban Municipalities	Number (1961)	Population (1961)	Number (1969)	Population (1969)
Cities	9	619,415	10	907,212
Towns	90	210,091	101	193,786
Villages and Summer Villages	159	50,345	167	45,631
Total Urban	258	879,851	278	1,146,629
Percentage Urban		(67.48 per cent)		(74.56 per cent)

Source: Province of Alberta, Department of Municipal Affairs,
Annual Report, 1961 and 1969, Edmonton, Queen's Printer, 1963 and 1971.

TABLE B

REAL PROPERTY TAXATION
BY URBAN MUNICIPALITIES IN
THE PROVINCE OF ALBERTA, 1961 AND 1969

Urban Municipalities	Real Property Taxation 1961 (Dollars)	Real Property Taxation 1969 (Dollars)
Cities	\$52,237,714.36	\$122,832,597.12
Towns	13,978,192.06	21,806,905.41
Villages and Summer Villages	2,980,954.78	4,564,244.45
Total	\$69,196,861.20	\$169,203,746.98

Source: Province of Alberta, Department of Municipal Affairs, Annual Report, 1961 and 1969, Edmonton, Queen's Printer, 1963 and 1971.

contain great varieties within our usual broad categories of the realms of nature and culture. As part of the character of place and area, any such variety is an important element of description and often of great significance in explanation. Of more specific geographical interest, however, is the unevenness of distribution within an area, creating what may be best described as the geographical diversity of the area.⁴

The primary intent of employing a geographic approach in studying property taxation and urban development is to illustrate the unevenness

⁴A. H. Clark, "Geographical Diversity and The Personality of Canada", Readings in Canadian Geography, ed. R. M. Irving, Toronto, Holt, Rinehart and Winston of Canada, Ltd., 1968, p. 3.

of distribution of property tax levels within the study area. Various aspects of property taxation have been discussed in a number of disciplines, including economics, land economics, public finance, law and land-use planning. Few geographic studies have included property tax indices.

A second consideration of the study is to examine the factors which influence the distribution of property tax levels. Finally, consideration is given to the functional relation between property taxation and urban development by determining the following conditions:

1. To what extent does property taxation influence urban development and as a result, the importance of property taxation as an instrument for regulating urban development.
2. The influence urban development has on the levels of property taxation.

Study Area

The study area consists of the Edmonton Regional Planning District, which covers more than 5,000 square miles (Figures A and B). The urban municipalities include the City of Edmonton, seven towns, and twelve villages, along with a number of summer villages. Five rural municipalities are also located in the District.

The study will be confined to the City of Edmonton, the towns and the villages. The summer villages are too small for this type of study. In addition, the property tax structures of the rural municipalities are not examined in this paper although it should be noted that several of these areas have been characterized by recent patterns of

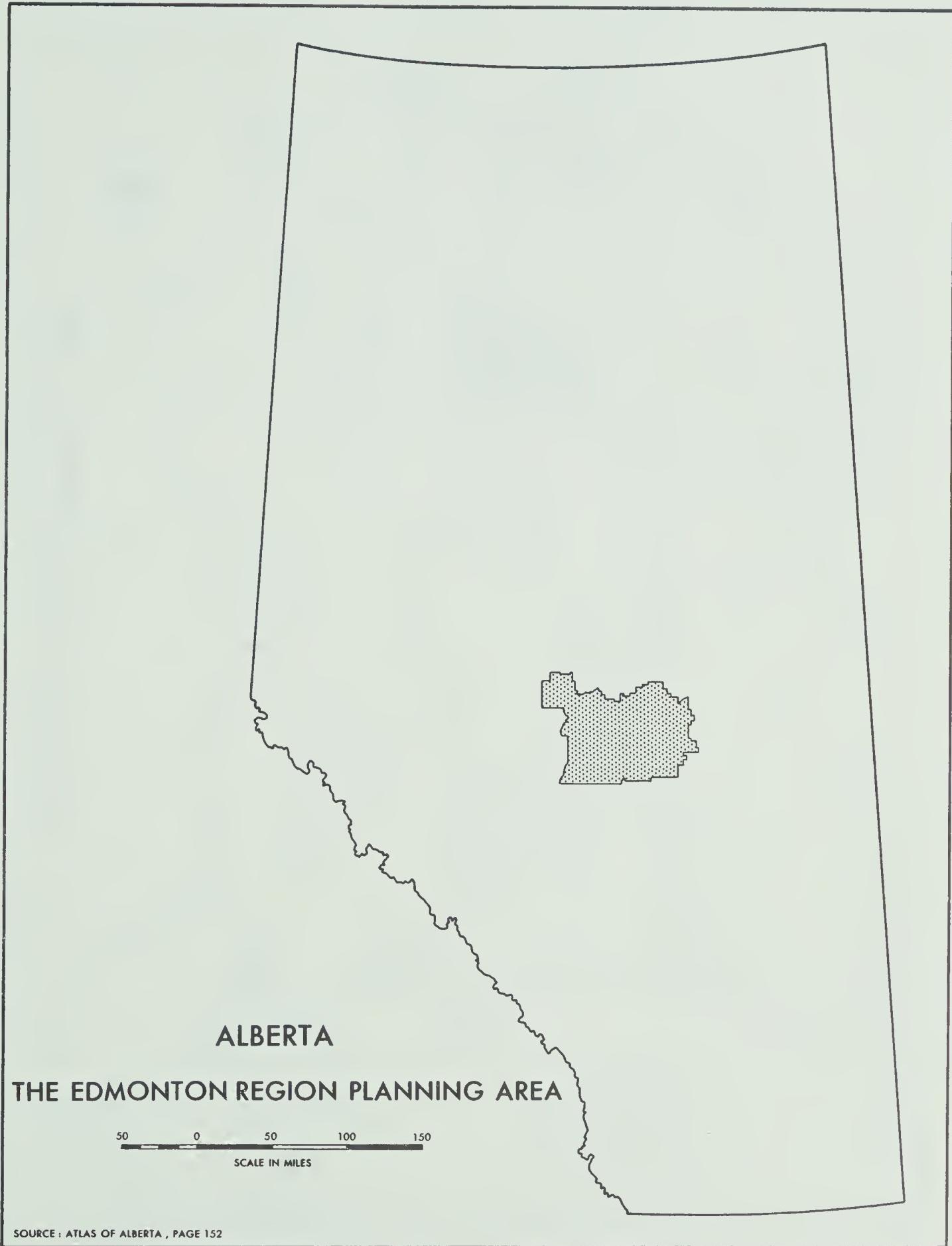
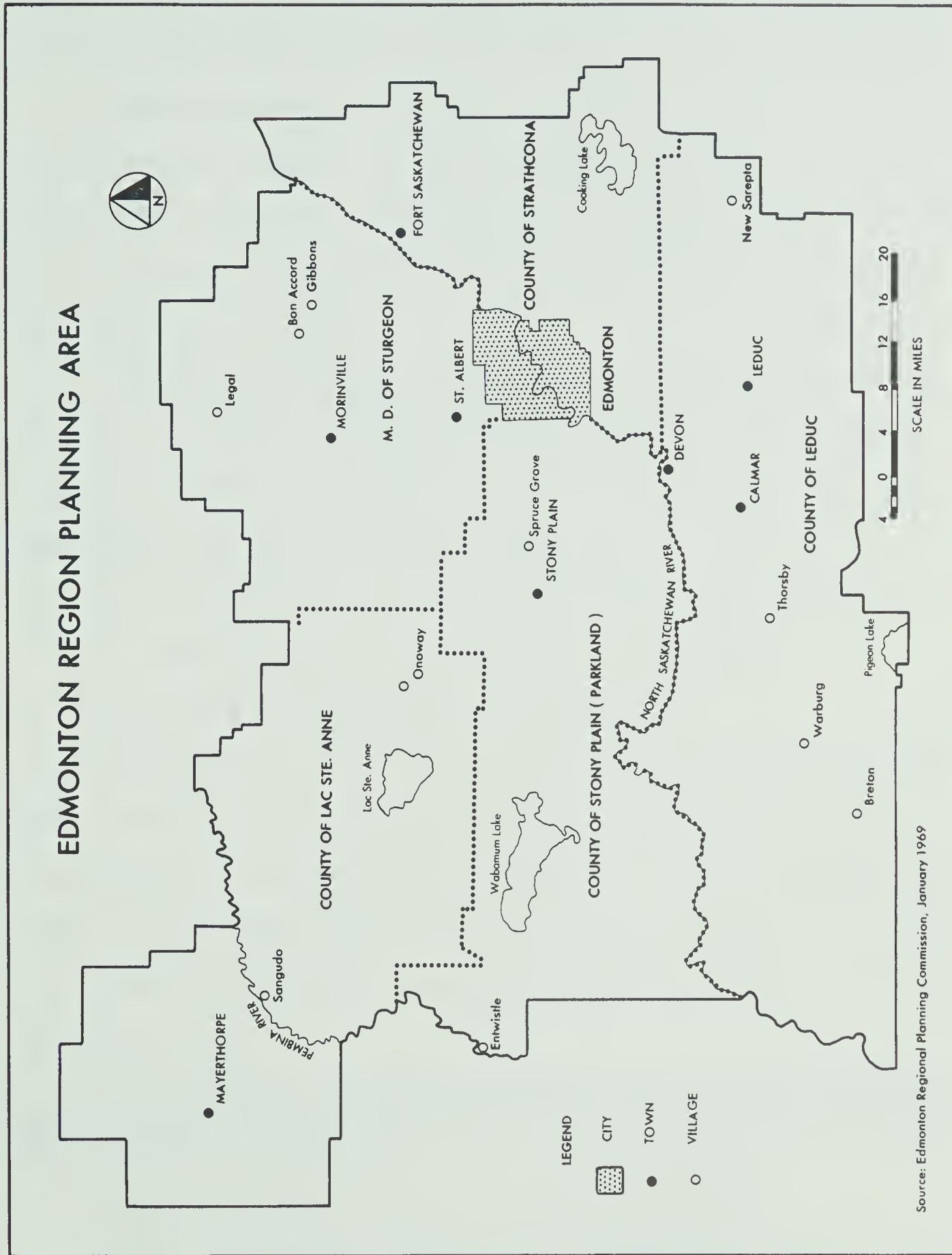


Figure A



Source: Edmonton Regional Planning Commission, January 1969

Figure 8

urbanization, e.g. the Hamlet of Sherwood Park contained approximately 11,000 residents in 1969; the County of Strathcona contains a large assessment base, due primarily to a sizeable petro-chemical industry.

The urban municipalities in the study area may be classified in three distinct divisions--the City of Edmonton, the inner ring and the outer ring. The City of Edmonton serves as a trade and social centre for the entire District and dominates the region, both politically, economically, and socially.

The inner ring which may be labelled as the "suburban ring", consists of the urban municipalities located within a twenty-mile radius of the City of Edmonton (Figure C). The communities in this zone display the following characteristics:

1. "a commuting rate with the City of Edmonton exceeding seven per cent of their resident population"⁵
2. a minimum population of 500 residents

The inner ring municipalities have been characterized by rapid growth rates.⁶ R. E. Murphy appropriately refers to this type of development as "an explosion to the suburbs".⁷ He distinguishes two types of developments--the high-priced suburban homes built by individuals or entire subdivisions consisting of groups of houses built by

⁵ M. Hassbring, A Satellite Community Study for the Edmonton and Calgary Areas, Edmonton, The Alberta Housing and Urban Renewal Corporation, October, 1969, p. 104.

⁶ See Chapter IV, "Population Growth--1960-1970".

⁷ R. E. Murphy, The American City, An Urban Geography, Toronto, McGraw-Hill Book Co., 1966, p. 393.

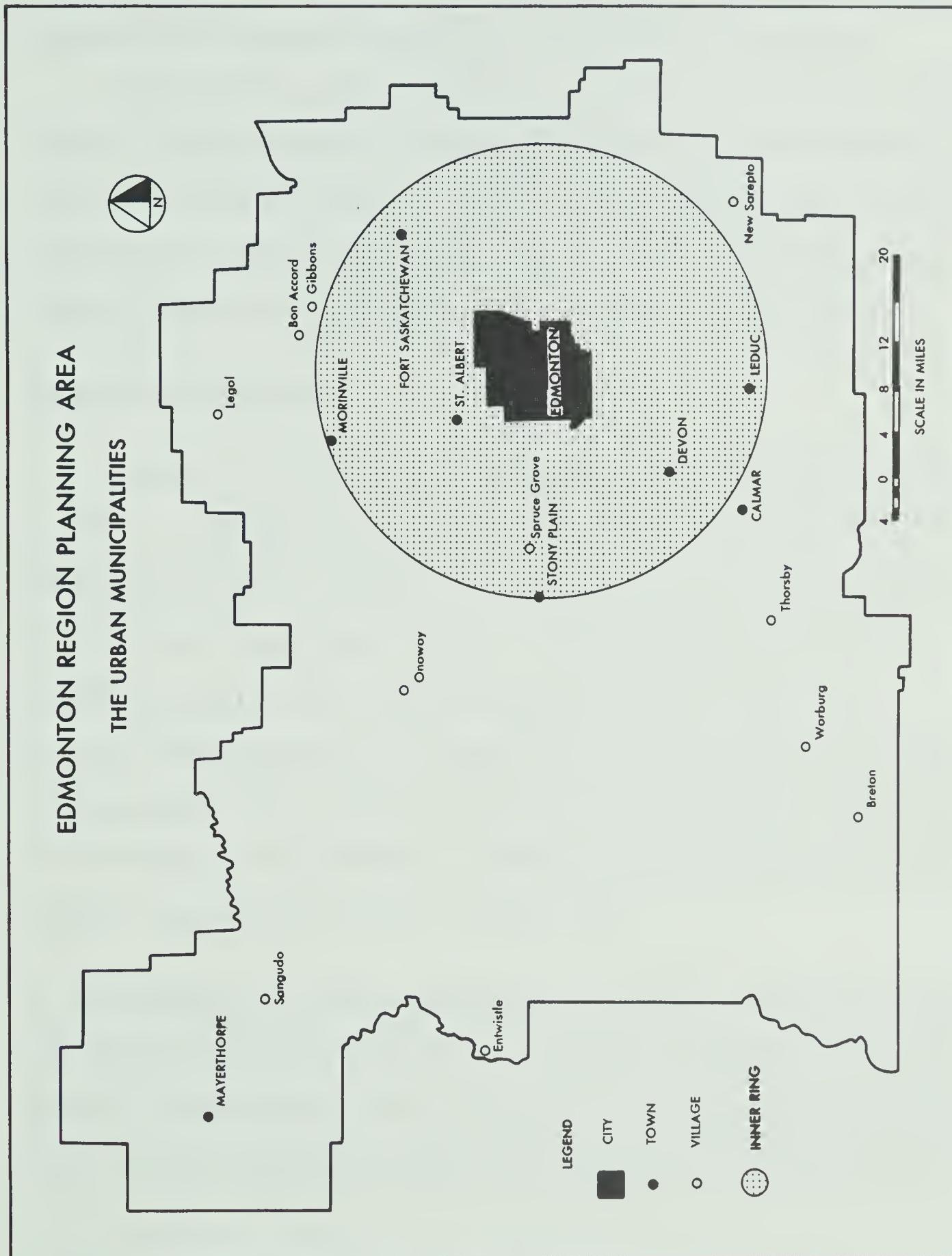


Figure C

developers. Probably the most important factor which has led to the rapid growth of these municipalities in the Edmonton area has been the availability of cheaper residential land in these communities.⁸

The remaining urban municipalities form the outer ring. This division consists primarily of smaller communities which function as agricultural service centres. Their average growth rate has been substantially less than the rates displayed by the other subregions, with several communities characterized by a declining population base.

Sources of Information

The data used in the study were gathered in the summer and fall of 1970. A substantial amount of the information was obtained from published statistical accounts. Other data were collected from government files and unpublished studies. Population and socio-economic statistics were obtained from the Dominion Bureau of Statistics. Personal communications with persons trained in the property taxation and assessment field also provided invaluable information. The sources of information may be divided into four categories--fiscal, assessment, land-use, population and socio-economic data.

1) Fiscal Data. The fiscal information was mainly compiled from the 1964 Annual Report of the Department of Municipal Affairs and the 1969 Financial Statements for each municipality. The municipal governments keep two fiscal accounts, current and capital.⁹ The current account

⁸M. Hassbring, op. cit., pp. 115-119.

⁹"... current account includes expenditures of a recurring

listings used in this study are the real property tax, total current revenue, and total current expenditure. Fixed assets and debenture debts are taken from the capital account.

2) Assessment Data. The basic assessment data were also obtained from the reports described in the previous section. An analysis of the 1969-1970 taxable property assessments by residential, commercial, industrial and vacant use was obtained by examining the assessment records for each municipality. A detailed account of the 1970 taxable rolls was available for the City of Edmonton.

The equalized assessments which were obtained from the Alberta Assessment Equalization Board, will be used to compare the assessment base for each municipality. Equalized assessments are adjusted approximately every five years with 1964 and 1969 being the latest base years.

3) Land-Use Data. A land-use classification for eight of the urban municipalities was available from the Provincial Planning Branch.¹⁰ This information was based on field-work conducted in 1969 and 1970.

A land-use survey for the remaining communities, with the

nature. It is customary for municipal governments to make budget estimates of current expenditure, and then to strike a property tax mill rate which will balance current expenditure and current revenue. Capital outlays are budgeted for in a capital account, and the funds required are obtained by borrowing from accumulated reserves, or from a senior government in the form of grants." E. J. Hanson, "Financing Education in Alberta", Research Monograph No. 11, The Alberta Teachers' Association, March, 1966, p. 40.

¹⁰Alberta, Department of Municipal Affairs, Provincial Planning Branch, an unpublished study entitled An Urban Land Use Analysis of Selected Alberta Communities.

exception of the City of Edmonton and the Village of Bon Accord, had been completed by the Edmonton Regional Planning Commission in the summer of 1970. However, the information had not been compiled from the land-use maps. The map areas were converted to ground areas by employing a random dot chart with a 97 per cent precision level. The latest land-use breakdown available for the City of Edmonton was for 1961.

4) Population and Socio-Economic Data. Population figures used in the study were established under the Municipalities Assistance Act.¹¹ The main advantage obtained by using these data is that the information is available for each year. Two possible weaknesses may exist in the data since:

1. Some of the smaller municipalities do not complete a census every year.
2. Provincial grants are determined by a municipality's total population. Municipalities undergoing a population decline are less inclined to maintain an up-to-date population count.

The socio-economic data were obtained from enumeration area print-outs made available by the Dominion Bureau of Statistics for 1961 and 1966.¹² The socio-economic analysis is restricted since the information for certain municipalities have become outdated, e.g. St. Albert

¹¹These data were obtained from Alberta, The Department of Municipal Affairs, Annual Report--1961 and 1964; and The Alberta Municipal Counsellor, Vol. 14, No. 1, June, 1969, p. 3.

¹²This information was obtained from the University of Alberta, Population Research Laboratory.

functioned primarily as an agricultural service centre in 1961 whereas today it serves as a dormitory suburb for the City of Edmonton.

The Study Period

The 1964-1969 study period for examining the changes in property tax levels was determined by three basic factors:

1. The latest available data on property taxation were for 1969.
2. The equalized assessments were readjusted in 1964 and 1969.
3. The first year in which all of the urban centres were listed as incorporated municipalities was in 1964.

The 1964-1969 period was particularly suitable for the thesis topic. Distinct patterns of population growth had occurred in the urban subregions. Rapid changes were also recorded in the amount of real property taxes levied.

REVIEW OF THE LITERATURE

A review of the literature indicates that property taxation is a diverse and complex subject. One of the main topics covered in the literature is the concept of property tax burdens.¹³ A regressive tax

¹³See for example: E. Bridges Jr., "The Elasticity of the Property Tax Base: Some Cross-Section Estimates", Land Economics, Vol. XL, No. 4, pp. 449-451; J. Burkhead, State and Local Taxes for Public Education, Syracuse University Press, 1963, pp. 35-40; I. J. Goffman, "The Burden of Canadian Taxation", Canadian Tax Paper No. 29, Canadian Tax Foundation, pp. 29-30; D. Netzer, Economics of the Property Tax, Washington, D.C., The Brookings Institution, 1966, pp. 263-268.

exists when property tax rates are substantially higher in the poorer communities than in the richer ones. Alternative forms of taxation are also extensively studied.¹⁴ However, these topics will not be discussed in this study.

The main purpose of this section is to review the articles which deal with property taxation and urban development. The literature is classified in two divisions:

1. The importance of the property tax for local governments.
2. Property taxation and urban development.

Importance of the Property Tax

A number of factors may be cited for the importance of the property tax. H. C. Goldenberg writes:

Real estate forms a large portion of the assets of a community and is an important source of income; it derives its value in large part from the general growth and development and the status of the community; it is located within and is not removable from a single locality; and it benefits very materially, particularly in urban areas, from the principal municipal services and expenditures.¹⁵

Similar arguments are also presented in other articles.¹⁶

¹⁴ See for example: C. F. Bickerdike, "Taxation of Site Values", Readings in the Economics of Taxation, The American Economics Association, Homewood, Illinois, R. D. Irwin Inc., 1959, pp. 382-383; H. T. Owens, "Site Value Taxation", Canadian Tax Journal, Vol. 1, No. 2, 1953, pp. 66-75; M. Rawson, "Property Taxation and Urban Development--Effects of the Property Tax on City Growth and Change", Research Monograph No. 4, Urban Land Institute, Washington, 1961, pp. 11-13.

¹⁵ H. C. Goldenberg, Q.C., "The Real Estate Tax", Canadian Chartered Accountant, Vol. 76, 1960, p. 560.

¹⁶ G. C. S. Benson, "Assessment Areas and The Values of Decentralized Government", The American Property Tax, Its History, Administration and Economic Impact, eds. G. C. S. Benson et al.,

The main idea contained in these writings is that the property tax performs an important role in local government finance. Ideally, the geographic base for the financing of a governmental activity would match the geographic area over which the benefits of the activity were received.¹⁷ In a relatively self-contained community, the property taxes paid by the taxpayers would yield benefits restricted primarily to that particular community. The next section will study recent patterns of urban growth and their effect on property taxation.

Property Taxation and Urban Development

The most notable development in the spatial patterns of the urban landscape has been the decentralization of activities from the urban core.¹⁸ This deconcentration of activities from the central city is a result of the increasing mobility provided by the automobile, the congestion in the central portions of the cities, the availability of cheaper land in the suburban areas and a rising standard of living of

Claremont, California, 1965, p. 2; J. Oliver, "Municipal Revenue Other Than Government Grants", Canadian Public Administrator, Vol. 6, 1963, pp. 57-63.

¹⁷ D. Netzer, "Intergovernmental Fiscal Policy and The Property Tax", Planning--1969, American Society of Planning Officials, Chicago, 1969, pp. 129-137.

¹⁸ For a discussion of decentralization, see for example: H. Blumenfeld, "The Modern Metropolis", Cities, Scientific American Book, New York, Alfred A. Knopf, Inc., 1969, pp. 40-58; C. C. Colby "Centrifugal and Centripetal Forces in Urban Geography", Readings in Urban Geography, eds. H. M. Mayer and C. F. Kohn, Chicago, University of Chicago Press, 1959, pp. 287-298; R. E. Murphy, The American City: An Urban Geography, New York, McGraw-Hill Book Co., 1966, pp. 36-42, 274-276, 346-352, 393-394.

the population. A review of the literature indicates that this type of urban development has influenced the property tax structure in several ways.¹⁹

1) Central City vs. Suburban Communities. A report issued by the National Commission on Urban Problems found that most metropolitan central cities have higher taxes than the average amounts for their respective suburban areas. The high taxes were primarily a result of the higher public expenditure needs of the central city created by the following factors:

1. There are more high-cost citizens from the standpoint of such poverty-linked services as public assistance, public health and hospital care, housing, etc.
2. The population concentration tremendously increases the necessary scope of such costly services as police and fire protection, parks and recreation, and sanitation. For most central cities, these services must meet the needs of an expanded daytime population which includes a net inflow of non-resident suburban communities.
3. Since the central cities developed before suburbia, their public facilities--schools, hospitals, water supply, and sewerage systems, typically included a far higher proportion of deteriorated structures and equipment in need of replacement or major renovation.²⁰

In addition, a comparison of the percentage of local taxes to personal income revealed 7.6 per cent for central cities, compared to only

¹⁹ See: D. J. Curran, "Infra-Metropolitan Competition", Land Economics, Vol. XL, No. 1, (Feb. 1964), pp. 95-99; D. Netzer, Economics of the Property Tax, The Brookings Institution, Washington, D.C., 1966, pp. 105-137; S. Sacks, W. F. Hellmuth Jr., Financing Government in a Metropolitan Area--The Cleveland Experience, New York, The Free Press of Glencoe, Inc., 1961, pp. 155-214; L. A. Stiles, "Some Possibilities for Meeting Property Tax Problems Arising from Multiplicity of Governmental Units", The Property Tax: Problems and Potentials, The Tax Institute of America, Princeton, 1967, pp. 418-422.

²⁰ Report of The National Commission on Urban Problems, Building The American City, New York, F. A. Praeger Publ., 1969, pp. 360-361.

5.6 per cent for residents outside central cities.²¹ R. U. Ratcliff made a similar conclusion.²²

The suburban municipalities are also confronted with particular problems. The typical residential suburb receives little revenue from the commerce and industry which employs its working population but it must still provide the social services demanded by these people. A study conducted in Metropolitan Toronto by G. A. Lascelles showed that rapidly growing residential suburban municipalities tended to become hard-pressed for finances to supply the educational, transportation, water supply and sewerage facilities which they required.²³

A final point which is often overlooked is the plight of the smaller urban municipalities which are losing population. These communities find that their municipal expenditures continue to rise while the cost must be spread among fewer residents, and a smaller assessment base.

2) Distribution of Taxable Property. One reason for the unequal distribution of taxable property is that a heavy concentration of industrial and commercial properties provides a larger tax base than the traditional residential land-uses. It has been suggested that approximately a 50-50 division of homes and business represents the minimum

²¹ Ibid., p. 361

²² ". . . we can say with certainty that the suburbanites bear a lesser burden than the citizens of the central city." R. U. Ratcliff, "The Dynamics of Efficiency in the Locational Distribution of Urban Activities", eds. H. M. Mayer and C. F. Kohn, op. cit., p. 309.

²³ G. A. Lascelles, "Financing Metropolitan Toronto", Canadian Tax Journal, Vol. 3, No. 1, 1955, pp. 16-24.

level that would allow the necessary municipal services to be carried out effectively.²⁴

In a study conducted in the Milwaukee Metropolitan Area on the relation between the tax base, land use and zoning practices, the following disadvantaged combinations were listed:

1. A balance between residential and industrial properties can be seriously harmful to the local fiscal structure (small amounts of industrial tax base per capita, high school costs from the large residential segment).
2. Moderate and low income residential housing on small lots would yield low property values per capita along with high school costs.²⁵

Whereas the previous study suggested the feasibility of promoting industrial and commercial properties in their tax base, J. Margolis concludes that "the lowest tax rates are found among the industrial enclaves, the highest are levied in the central cities, while the balanced and dormitory cities have almost the same rate".²⁶ It would seem that the existence of similar rates in both the balanced and the dormitory cities raises doubts about the validity of a policy of "industrialization" in order to reduce property tax rates.

PROPERTY TAXATION IN ALBERTA

Assessment Schedules

In Alberta, a series of Acts governing assessment and taxation

²⁴Ibid., p. 16.

²⁵D. J. Curran, op. cit., pp. 95-96.

²⁶J. Margolis, "The Variation of Property Tax Rates Within a Metropolitan Region", National Tax Journal, Vol. 9, 1956, pp. 328-329.

provides for a tax to be levied on all real property, which besides land and buildings, includes:

. . . appliances, equipment, machinery and other chattels or fixtures that form an integral part of the plant designed for, or used in manufacturing or processing, the production of natural resources, or the transmission of such resources by pipeline.²⁷

The basis of valuation for real property in Alberta is termed the fair actual value. Land is assessed at 100 per cent of the fair actual value. Factors to be considered by an Alberta assessor in arriving at this value include:

. . . among other things, the advantages and disadvantages of the location, the quality of the soil, the annual rental value the lands are reasonably worth for the purpose for which they may be used, the value of the standing timber, and such other consideration as the Assessment Commission directs.²⁸

A sound basis for the valuation of a particular building or improvement is "reproduction cost less due allowance for depreciation and obsolescence".²⁹ In a municipality where improvements are valued pursuant to the provisions of the 1959 Provincial Assessment Manual, the assessor shall use for assessment purposes:

1. 60 per cent of the fair actual value of improvements, other than manufacturing and processing machinery, and special franchise equipment.
2. 30 per cent of the fair actual value of manufacturing and processing machinery and special franchise equipment.
3. 50 per cent of the fair actual value of a single-family dwelling classified as a residential improvement by a bylaw

²⁷ F. H. Finnis, "Real Property Assessment in Canada", Canadian Tax Papers, No. 30, Canadian Tax Foundation, Aug., 1962, pp. 8-9; Province of Alberta, Municipal Taxation Act, R.S.A. 1970, Chapter 251, S. 2, S.S. 13, iii.

²⁸ K. G. Crawford, Canadian Municipal Government, Toronto, University of Toronto Press, 1968, p. 280.

²⁹ Ibid., p. 282.

of the municipality.³⁰

A second assessment schedule, the 1967 Provincial Assessment Manual, is used in several of the municipalities whereby improvements are valued by 45 per cent, 22.5 per cent, and 37.5 per cent of the fair actual values.

Equalized Assessment

Equalization is defined in The Municipalities Assessment and Equalization Act as:

Equalized assessment means the valuation of rateable lands within a municipality established on a common basis as related to the valuation of the total rateable lands within all municipalities in the Province as determined on a similar basis.³¹

"Rateable lands" means:

1. lands and buildings and other improvements and franchises that are assessed by a municipality.
2. property assessed under The Electric Power and Pipe Line Assessment Act.
3. property the valuation of which has become the assessment thereof in accordance with the Municipal and Provincial Properties Valuation Act.

A "factor" is used to convert live assessment plus some exempt and municipal properties to equalized assessments, depending upon the munic-

³⁰Government of Alberta, Assessment Manual--1967, published by authority of Hon. E. H. Gerhart, Department of Municipal Affairs, 1967, Section 1, pp. 1-2.

³¹As defined by "The Municipalities Assessment and Equalization Act", Statutes of Alberta, 1957, Chapter 61.

ipality and the assessment manual used.³²

The purpose of equalized assessment is to ensure that the burden of contribution to the hospital and education programs should fall equitably on the owners of real property throughout the Province.³³ Several recent articles have maintained that the current system is not the best method for determining fair assessments.³⁴

Provincial-Municipal Financing

A major problem facing urban local governments is that the municipal tax base is not broad enough to provide the required tax revenue for expanding services. In Alberta, the provincial government has initiated several programs to alleviate the municipal financial burdens including grants-in-aid, grants in lieu of taxes, and subsidized loan programs.

Unconditional grants are paid to municipal governments to provide a better standard of local service than can be supported by local taxes alone. The Municipalities Assistance Act provides all municipalities

³²For further details, see for example: Report of The Special Committee Appointed by the Government of Alberta to Study Assessment and Taxation, Edmonton, Alberta, March, 1970, pp. 20-23.

³³The provincial government has passed legislation which requires a specified mill rate on the equalized assessment of a municipality to help finance the School Foundation Progress (1969--28 mills) and the Hospital Benefit Program (1969--4 mills). The 1970 School Foundation mill rate was set at 30 mills on the equalized assessments; the 4 mills for the Hospital Benefits Program was dropped in 1970.

³⁴See for example: Brief--Bill 35, An Act to Amend The Municipalities Assessment and Equalization Act, The Alberta Urban Municipalities Association, March, 1969; Urban Crisis--Alberta Municipal Finance Study, presented by The Cities of Alberta, The Alberta Urban Municipal-

with an annual unconditional grant of one-third of the royalties collected during the immediately preceding year on petroleum and natural gas transactions. The amount is calculated by way of an equalization formula based on population, area and assessment data for each municipality.³⁵

Conditional grants are given "to enable local authorities to provide services that are of wider than local concern, e.g. health, welfare, education, roads".³⁶ The previously mentioned School Foundation Program and the Hospital Benefits Program are examples of conditional grants.

The Crown Property Municipal Grants Act "provides for grants in lieu of taxes on all provincial property up to the annual amount that would be realized by the municipality if the property was subject to the municipal property tax".³⁷

It has been shown that the property tax is a regressive tax--it falls proportionately more heavy on persons of low income than persons of high income.³⁸ The Homeowner's Tax Discount Act provides for payment

ties Association and The Public and Separate School Boards in The Cities, January, 1968, pp. 60-61.

³⁵ M. A. Tyler, Handbook on Provincial-Municipal Cost Sharing Programs, prepared for the Canadian Federation of Mayors and Municipalities, 1966, p. 209.

³⁶ Ibid., p. 109.

³⁷ Ibid., p. 209.

³⁸"... a study in Calgary which revealed that people earning about \$3,000 a year, spend nine per cent of their income on property taxes; people earning \$7,000 spend only 4.6 per cent, and people earning about \$11,000 annually spend only 3.5 per cent." D. Cole,

to the municipalities by the Province of up to the first \$50 of the annual municipal tax for each home-owner.³⁹ In effect, the home-owner tax discounts are an attempt to reduce the regressiveness of the property tax.

A third form of provincial assistance was started in 1956 when The Alberta Municipal Financing Corporation was organized. The Corporation obtains funds by issuing its own debentures, guaranteed as to principal and interest by the Province, and in turn, extends loans to local governments by taking their debentures in exchange.

"The Property Tax Regressive", The Edmonton Journal, October 29, 1970, p. 18.

³⁹This amount has subsequently been increased to the first \$75 of the annual municipal tax for each home-owner.

Chapter I

PROPERTY TAX LEVELS

The main objective of this study is to examine the spatial variations of property taxation which exist for the urban municipalities located within the Edmonton Regional Planning District. The purpose of this chapter is to illustrate that property tax levels vary substantially among these centres. Subsequent chapters will analyze the relationship between local levels of property taxation and a number of selected community characteristics.

MEASUREMENT OF PROPERTY TAX LEVELS

Several measures were considered to study property tax levels. Probably the best-known index is the mill rate which is obtained by using the formula:

$$MR = \frac{T}{B_r} \times 1,000$$

where MR = the mill rate

T = the real property tax levy

B_r = the real property assessed base

The main reason for not using this index is that it is difficult to compare the real property assessed bases of the urban centres since property assessments in Alberta are still regulated by a number of different assessment schedules.¹

The effective property tax rate is similar to the mill rate except that the equalized property assessed base is substituted for the real property assessed base.. The effective tax rate is obtained by using the formula:

$$\text{ETR} = \frac{T}{B_e} \times 100$$

where ETR = the effective tax rate

T = the real property tax levy

B_e = the equalized property assessed base

The use of equalized assessments enables a comparison to be made of the magnitude of the assessed property valuations among the municipalities.²

Several previous studies employed effective tax rates to depict levels of property taxation.³ This index of property taxation will also

¹This item is explained more fully under the introductory section on the valuation of improvements for assessment purposes.

²"...it is necessary to use the equalized assessments determined by the Assessment Equalization Board in making comparisons among the municipalities." E. J. Hanson, The Potential Unification of the Edmonton Metropolitan Area, Edmonton, University of Alberta, 1968, p. 135.

³See for example: M. Beck, Property Taxation and Urban Land Use in N.E. New Jersey, Research Monograph No. 7, Urban Land Institute, 1963, p. 69; J. P. Pickard, Changing Urban Land Uses as Affected by Taxation, Research Monograph No. 6, Urban Land Institute, 1962, p. 41.

be used in the present study.

The property tax per capita is a popular expression of tax burden due primarily to its easy method of calculation. The property tax per capita is calculated by using the formula:

$$PTC = \frac{T}{P_r}$$

where PTC = the real property tax levy per capita

T = the real property tax levy

P_r = the resident population

This index will provide a second measure of property taxation to be used in the study. The main reason for employing two indices of property tax levels is to provide a broader perspective of the spatial variations of property taxation in the study area.

THE PROPERTY TAX PER CAPITA

Most local governments are being confronted with mounting financial problems. One direct result of this development has been the increasing demands levied against the real property assessed base. The urban centres in the Edmonton Regional Planning District have also been characterized by substantial increases in property taxes (Table 1.1).

The property tax per capita in the City of Edmonton increased from \$79.49 in 1964 to \$123.45 in 1969. The inner ring municipalities increased from \$92.54 in 1964 to \$143.24 in 1969. The average increase for the outer ring municipalities amounted to only \$23.67 for 1964-1969.

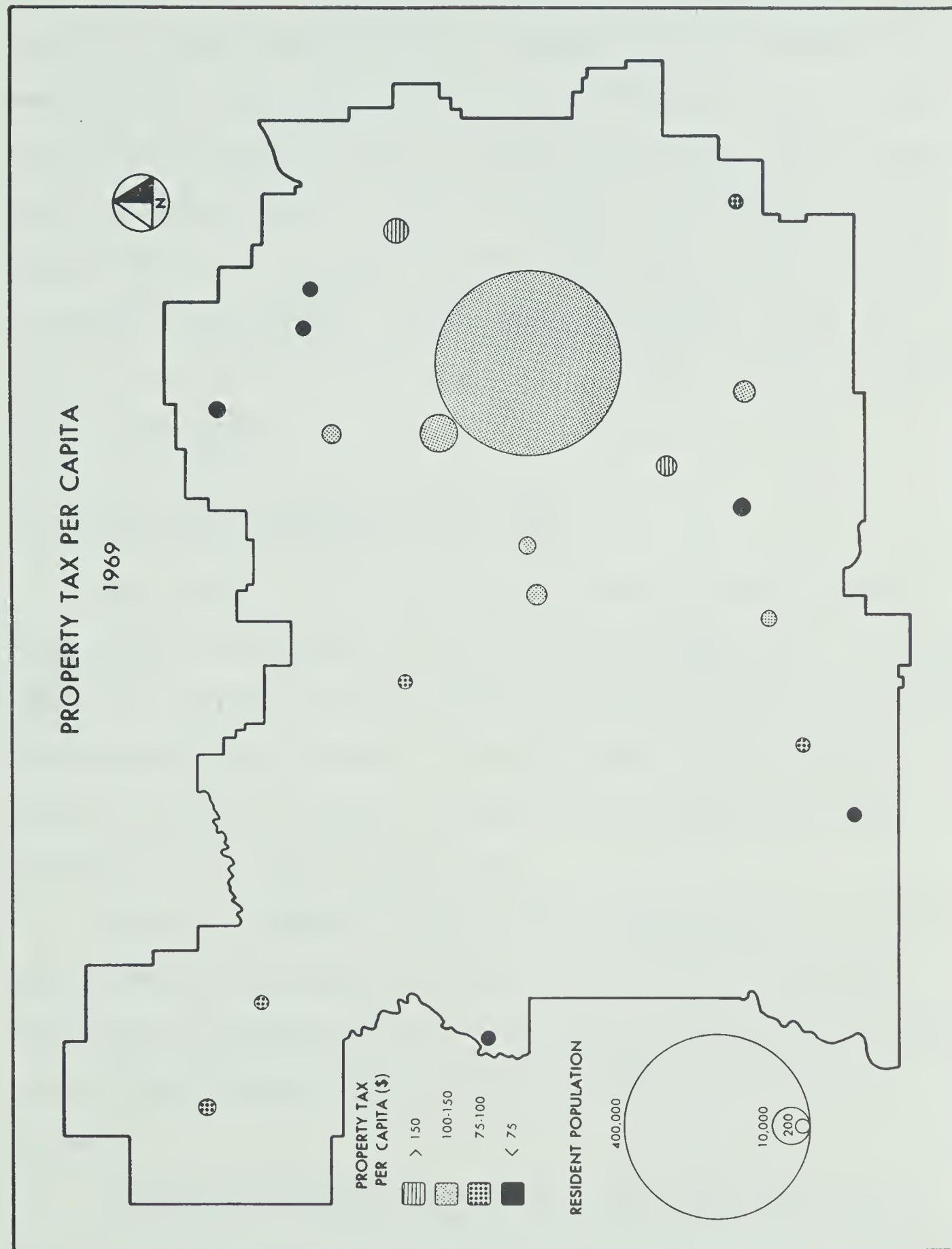


Figure 1.1

They also had substantially lower property taxes per capita (Figure 1.1).

Any explanation of the differences in the property taxes per capita for the three subregions has to consider the distribution of the sample values. From Figure 1.6 it is readily observed that the outer ring municipalities are generally characterized by the lowest property taxes per capita while the inner ring municipalities usually have the highest levels. The property tax per capita for the City of Edmonton is approximately a median value between the two other subregions. It may be concluded that distinct regional variations exist for the property tax per capita.

Components of the Property Tax Per Capita

Real property taxes are levied in Alberta to finance expenditures incurred by municipal, school and hospital functions. It seems likely that the fluctuations recorded in the real property tax levies stem primarily from a change in revenue demanded by one particular function. Table 1.1 provides a summary of the components of the property tax per capita (Figure 1.2).

The City of Edmonton showed a substantial increase in the municipal portion of its property tax per capita. School requisitions experienced the greatest rates of increase; in particular, the supplementary school tax per capita changed from \$8.83 in 1964 to \$32.16 in 1969.

Substantial changes also occurred in the composition of the property tax per capita for the inner ring municipalities. Municipal requirements per capita increased by 45.38 per cent--the 1969 amount

TABLE 1.1

THE PROPERTY TAX PER CAPITA (DOLLARS)
BY SUBREGIONS, 1964 AND 1969

Subregion	Municipal		Supplementary School		School Foundation		Hospital		Total	
			1964	1969	1964	1969	1964	1969	1964	1969
City of Edmonton	21.25	31.61	8.83	32.16	42.72	52.03	6.68	7.65	79.49	123.45
Inner Ring	32.48	47.22	10.24	32.78	42.25	53.39	9.04	9.84	92.54	143.24
Outer Ring	25.75	27.27	7.07	18.15	27.35	30.72	5.23	4.78	65.43	80.92
Region	27.95	34.47	8.17	23.97	33.35	39.72	6.57	6.70	75.62	104.86

Source: The data were calculated from: Alberta, The Department of Municipal Affairs, The Annual Report, 1964 and The Financial Statements, 1969.

PROPERTY TAX PER CAPITA

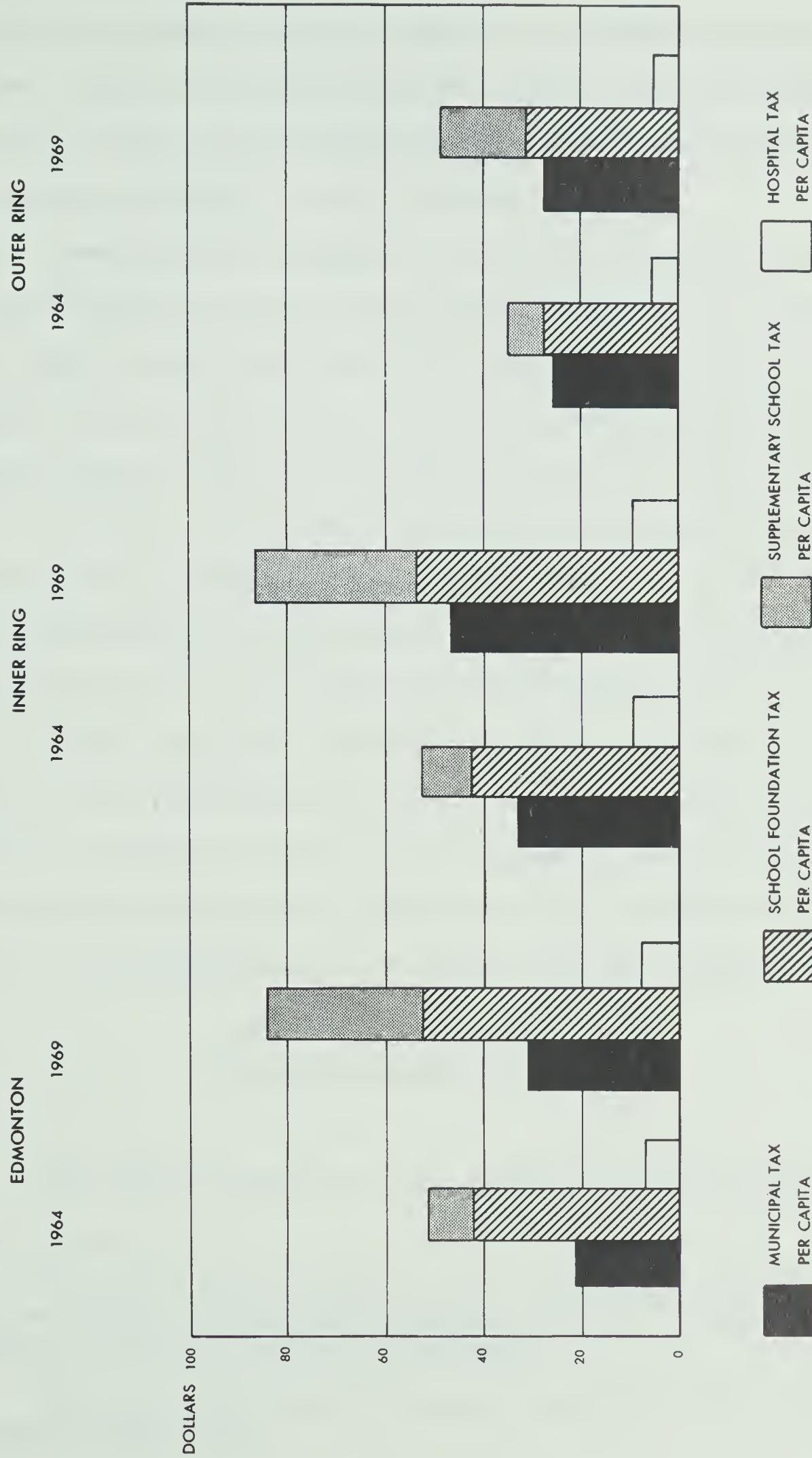


Figure 1.2

of \$47.22 per capita is also the highest rate recorded for the sub-regions. Table 1.1 indicates that the increased property tax per capita for the outer ring municipalities is primarily attributable to increased requirements for school purposes.

A summary of the components of the property tax per capita for each municipality is listed in the Appendix--Tables 3 and 4. Several items may be obtained from these data. With the exception of St. Albert, all inner ring municipalities are characterized by relatively high municipal taxes per capita. One possible explanation for this development is that these municipalities are having to provide new services and facilities in response to their recent population growth.⁴ A second explanation may be that the Provincial cost-sharing programs have less influence on the fiscal operations of these communities.⁵

It also appears that supplementary school requisitions calculated on a per capita basis are directly related to population growth. The City of Edmonton and the inner ring municipalities are generally characterized by the highest supplementary school requisitions per capita. This relationship will be further analyzed in Chapter IV.

EFFECTIVE PROPERTY TAX RATE

The effective property tax rate expresses the real property tax

⁴ It appears that St. Albert, which is faced with high school costs per capita, is attempting to control its property tax rate by reducing revenues for municipal requirements.

⁵ Examples of this are the Municipal Assistance Grants, Grants for Roads, Bridges, etc.

levy as a percentage of the total equalized assessments within a community. This rate is essentially based on a community's capital assets and should provide a more realistic measure of the actual property tax burden for each municipality.

Equalized assessments for the City of Edmonton experienced a 40.48 per cent increase for the period 1964-1969.⁶ This is particularly important since total real property taxes experienced an 82.41 per cent increase over the same period. This means that real property taxes increased at approximately twice the rate of equalized real property assessments. Similar advances were recorded for the remaining subregions although the actual amounts were much smaller.

In the City of Edmonton, the real property tax increased from 5.12 per cent of the equalized assessed property base in 1964 to 6.64 per cent in 1969 (Table 1.2; Figure 1.3). The highest rates are recorded for the inner ring municipalities (Figure 1.4). The average effective tax rate for the outer municipalities is also substantially higher than the rate for the City of Edmonton.

A comparison of the tax levels listed in Figures 1.6 and 1.7 indicates that the distribution of the effective tax rates is very different from that of the property taxes per capita. The effective tax rate for the City of Edmonton is one of the lowest. The most significant item is the wide range in effective tax rates for the inner ring municipalities. The outer ring centres are clustered

⁶ Equalized assessments for the municipalities are listed in the Appendix, Tables 5 and 6.

TABLE 1.2

THE EFFECTIVE PROPERTY TAX RATE (PER CENT)
BY SUBREGIONS, 1964 AND 1969

Subregion	Municipal 1964	Municipal 1969	School 1964	School 1969	Hospital 1964	Hospital 1969	Total 1964	Total 1969
City of Edmonton	1.37	1.70	3.32	4.53	0.43	0.41	5.12	6.64
Inner Ring	2.25	2.76	3.10	4.83	0.53	0.55	5.87	8.13
Outer Ring	2.42	2.51	3.27	4.50	0.50	0.45	6.28	7.47
Region	2.31	2.56	3.21	4.64	0.50	0.48	6.08	7.66

Source: The data were calculated from: Alberta, The Department of Municipal Affairs, The Annual Report, 1964 and The Financial Statements, 1969.

EFFECTIVE PROPERTY TAX RATE

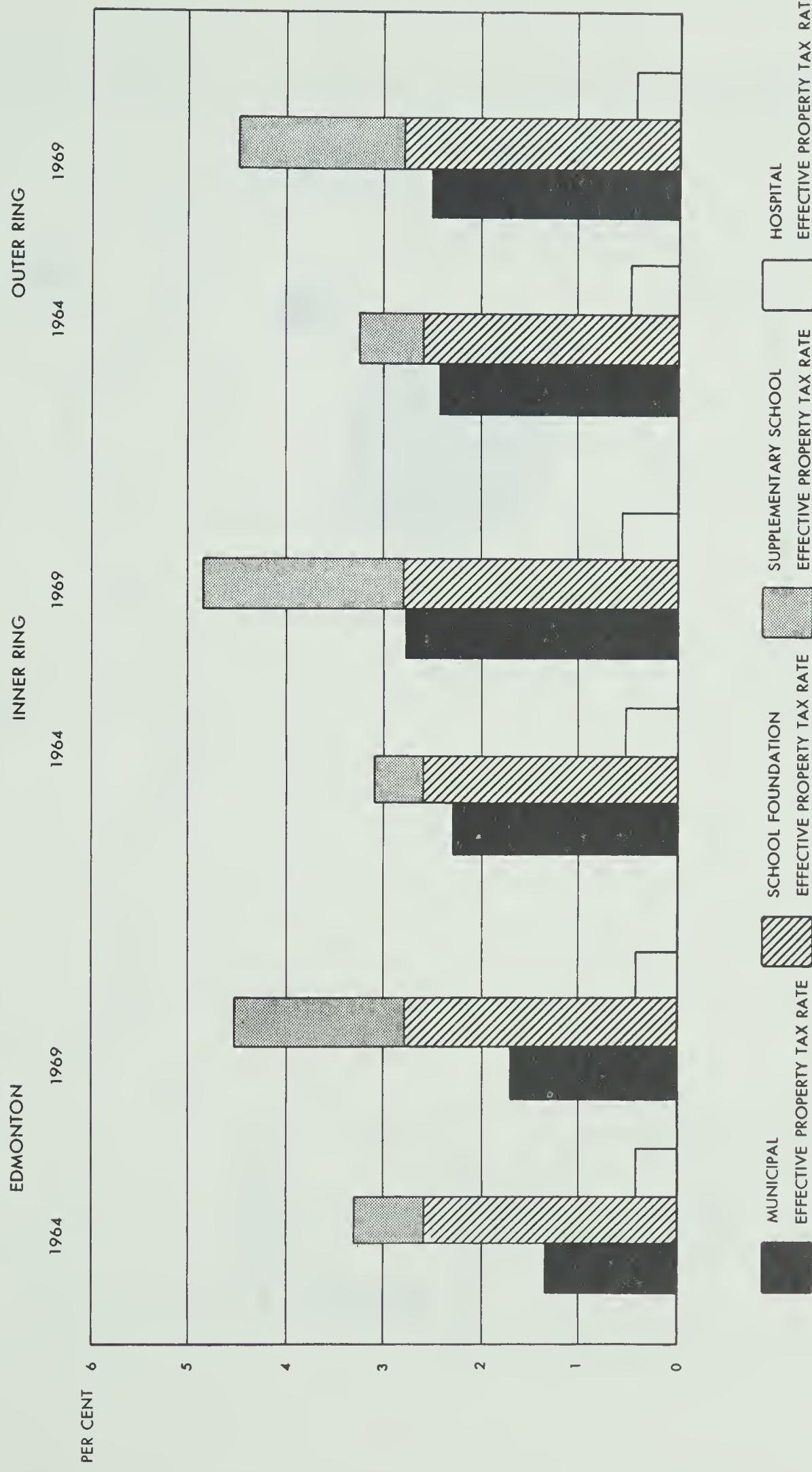


Figure 1.3

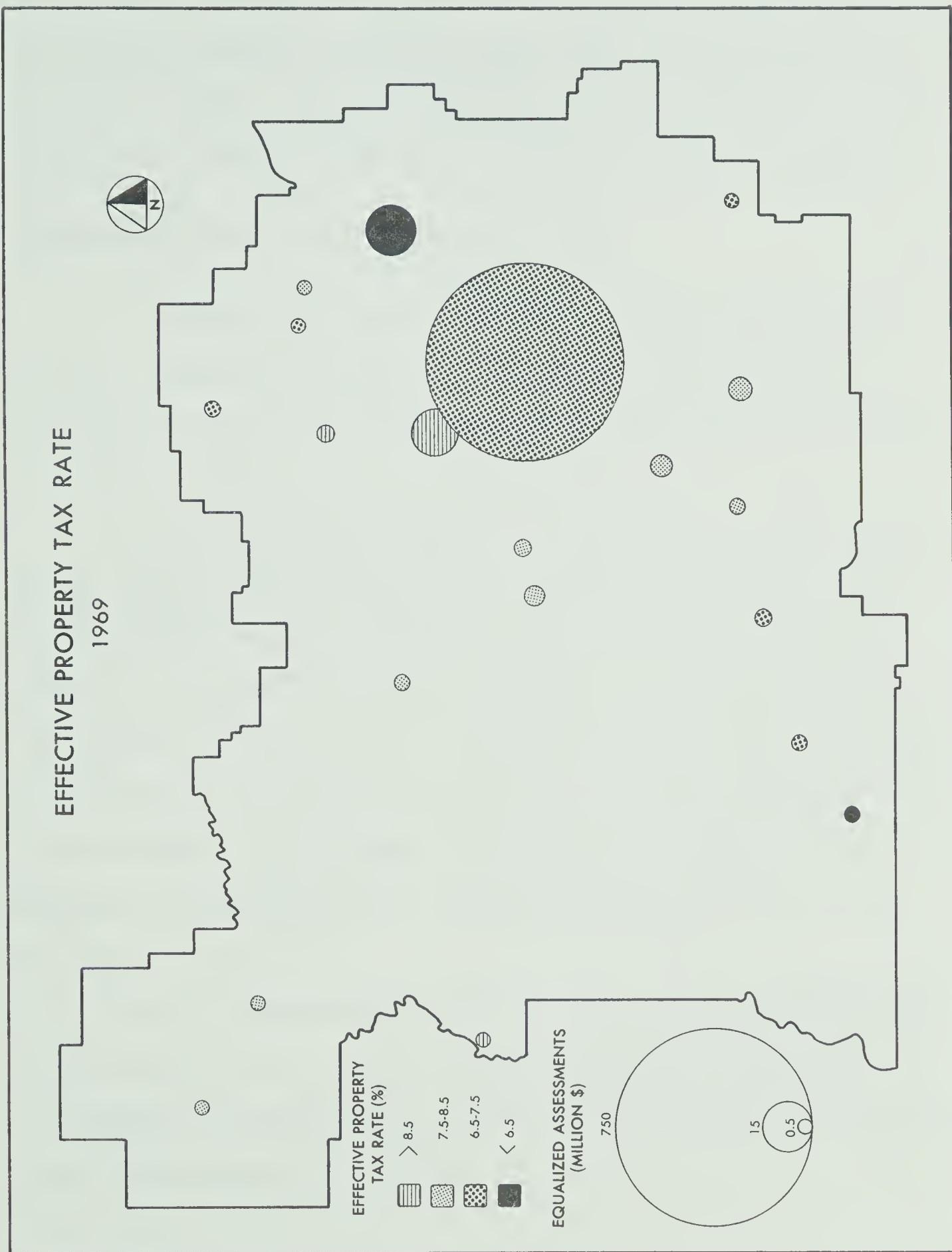


Figure 1.4

between the 7.0 and 8.0 per cent levels although several of these municipalities display effective tax rates which vary substantially from this grouping. The main conclusion is that little value can be placed on the average effective tax rates for the three subregions.

Components of the Effective Property Tax Rate

It has been shown that a subregional classification of the effective property tax rate is of limited use. The components of the effective tax rate for each municipality are listed in the Appendix, Tables 5 and 6.

A comparison of the components of the property tax per capita and the effective tax rate indicates a different pattern for these municipalities (Appendix, Tables 3, 4, 5, and 6). The highest proportion for municipal purposes of the effective tax rate is recorded for Entwistle (4.39 per cent); the municipal property tax per capita is only \$32.57. By comparison, the Town of Devon had the highest municipal property tax per capita (\$61.29) yet the municipal tax expressed as a proportion of the equalized assessments is only 2.96 per cent.

Similar cases also exist for the school and hospital components of the property tax. The main conclusion is that the composition of the property tax levels varies with the type of property tax index used in the interpretation of the data.

THE EQUALIZED PROPERTY TAX BASE PER RESIDENT

The relationship between the property tax per capita and the effective property tax rate may be explained by introducing a third component--the equalized property tax base per resident. It is calculated by using the formula:

$$\text{RSR} = \frac{\text{PTC}}{\text{ETR}}$$

where RSR = the equalized property tax base per resident

PTC = the real property tax levy per capita

ETR = the effective property tax rate

Table 1.3 lists the equalized property tax base per resident for the three subregions. The 1969 equalized property tax base per resident is highest in the City of Edmonton (\$1,858.43), followed closely by the inner ring municipalities (\$1,838.86). The outer ring averaged only \$1,099.01 of equalized assessments per resident. (Figure 1.5). The City of Edmonton also has had the most rapid increases in its equalized property tax base per resident.

The distribution of the sample values indicates that the equalized property tax base per resident displays definite subregional clusterings (Figure 1.6). The outer ring communities generally are characterized by the lowest rates; the inner ring municipalities have much higher figures although a much wider range of values is indicated. Fort Saskatchewan and Devon exert an upward pull on the average equalized property tax base per resident for the inner. The City of

TABLE 1.3

THE EQUALIZED PROPERTY TAX BASE
 PER RESIDENT (DOLLARS)
 BY SUBREGIONS
 1964 AND 1969

Subregion	RSR 1964	RSR 1969	Percentage Increase 1964-1969
City of Edmonton	1,553.44	1,858.43	19.64
Inner Ring	1,624.98	1,838.86	13.16
Outer Ring	1,055.44	1,099.01	4.13
Region	1,279.93	1,359.93	6.26

Source: The data were calculated from: Alberta, The Department of Municipal Affairs, The Annual Report, 1964 and The Financial Statements, 1969.

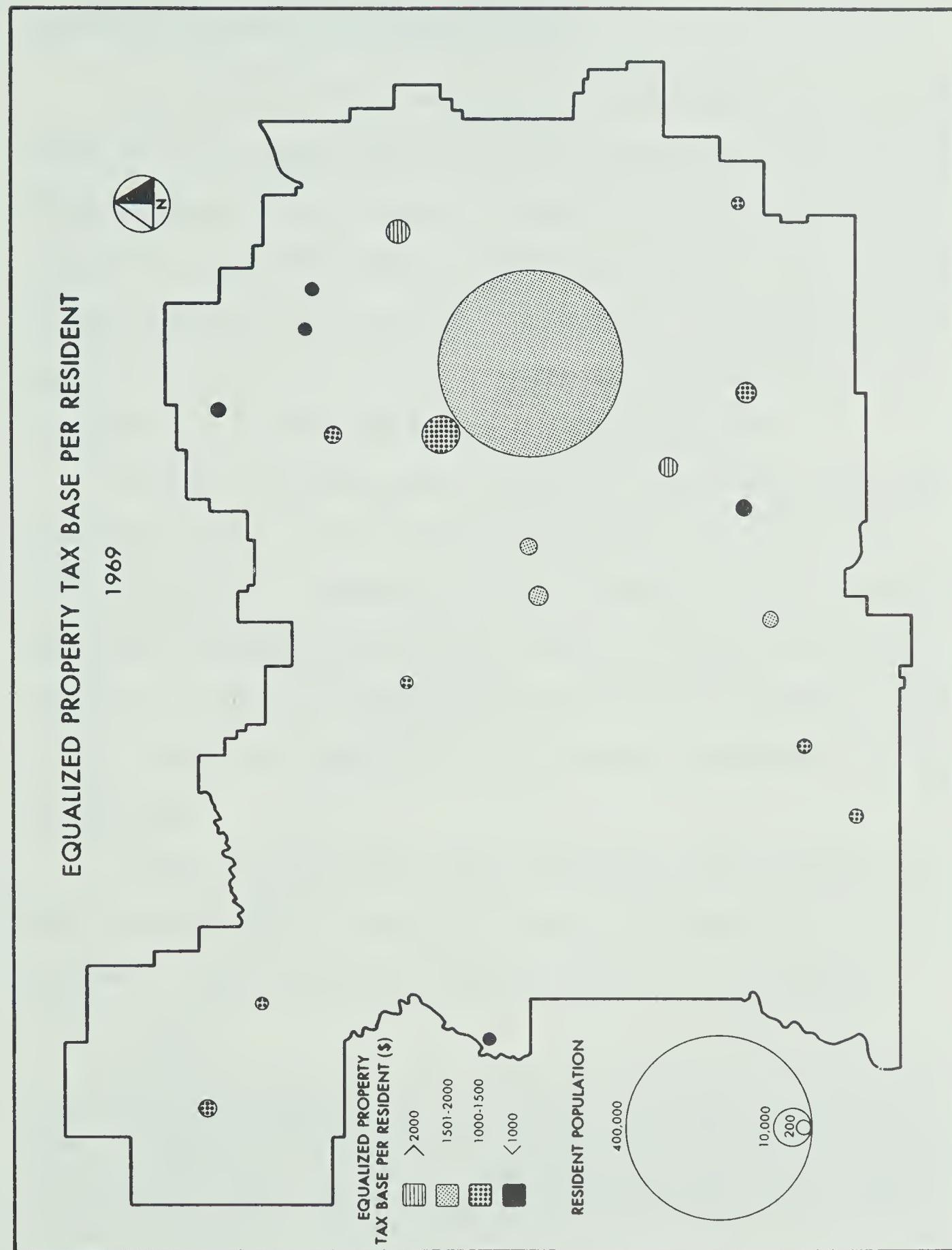


Figure 1.5

Edmonton also has a relatively high measure.

Comparison with the Property Tax Levels

The purpose of this section will be to conduct a more extensive analysis of the relationship between the property tax per capita, the effective property tax rate and the equalized property tax base per resident. It has been suggested that the tax base is much more unpredictable than the rates of property taxation.⁷ A wide range in the equalized property tax base per resident is also characteristic of the centres in the Edmonton Regional Planning District.

Figure 1.6 indicates that a definite relationship exists between the property tax per capita and the equalized property tax base per resident. Communities with high property taxes per capita are usually characterized by a high equalized property tax base per resident. The revenue-sharing programs administered under the equalization schemes in Alberta are the main factors responsible for this relationship.

Figure 1.7 shows that little association exists between the effective property tax rate and the equalized property tax base per resident. A wide variation is found to exist for both indices.

⁷"The local property tax resources per resident tend to vary much more widely than the per capita costs of services requiring local finances. This is due to variation in the character and quality of properties: residential, commercial and industrial property of varying age and values; and vacant land, which may also differ in value according to its characteristics and location." J.P. Pickard, op. cit., p. 28.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
EQUALIZED PROPERTY TAX BASE PER RESIDENT

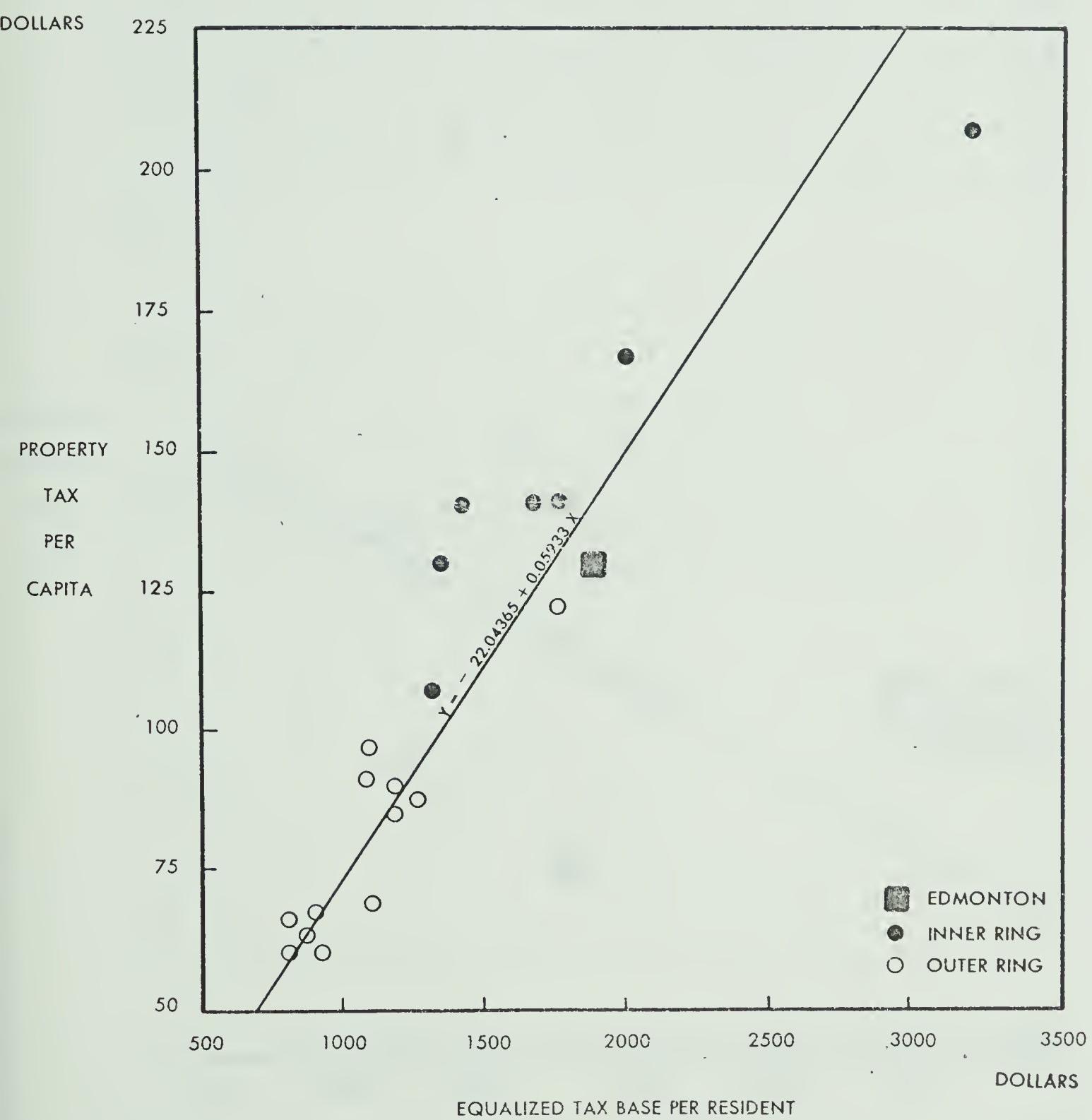


Figure 1.6

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
EQUALIZED PROPERTY TAX BASE PER RESIDENT

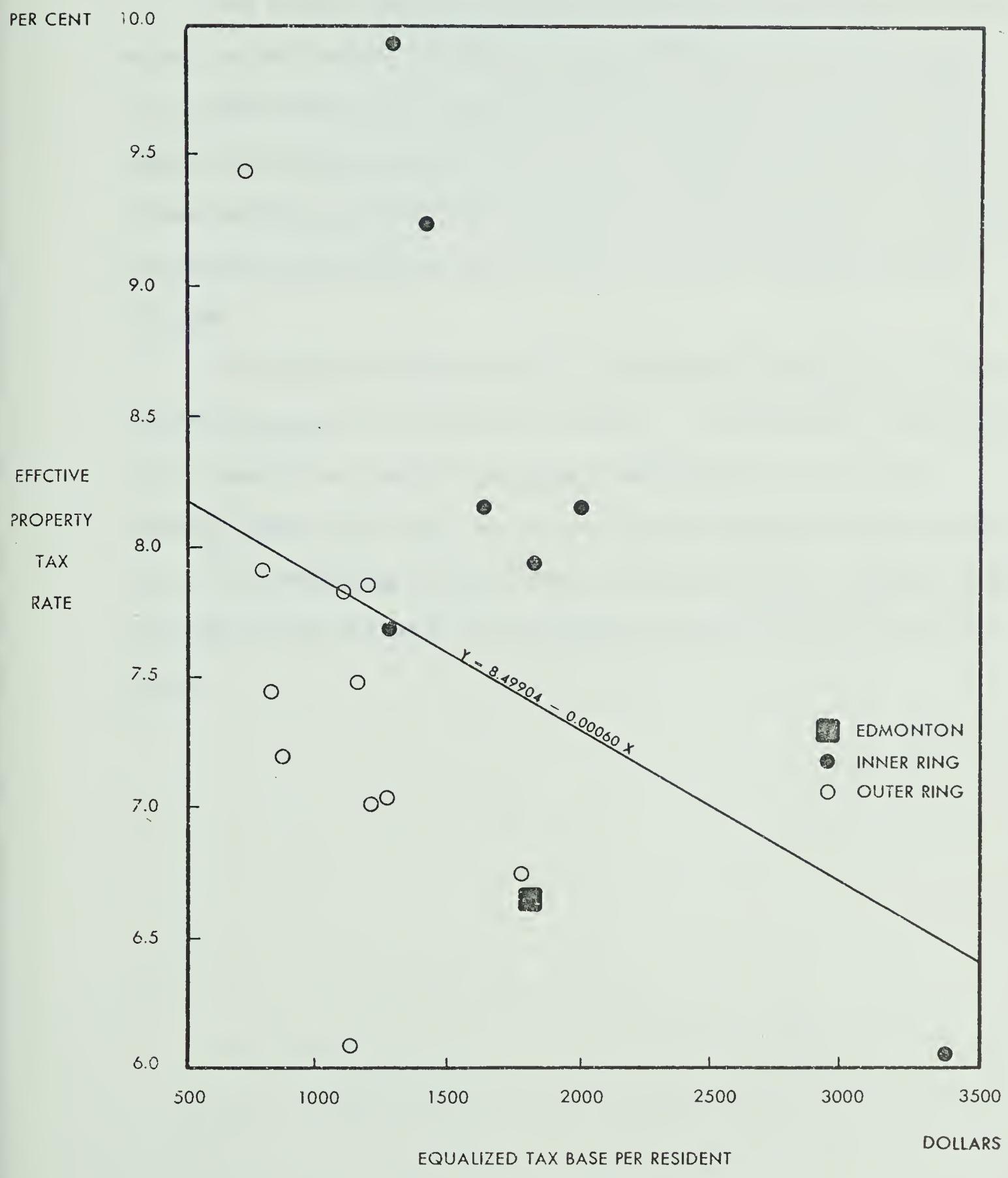


Figure 1.7

CONCLUSION

The basic conclusion from this chapter is that a wide variation exists in the levels of property taxation among the municipalities. It has been shown that these variations are directly linked to the composition of the property tax levies. Furthermore, a much broader viewpoint has been obtained by using two separate indices of property tax levels--the property tax per capita and the effective property tax rate.

The property tax per capita is definitely associated with the equalized property tax base per resident. A comparison of the effective property tax rate and the equalized property tax base per resident shows that little correlation exists between these two variables. The remaining chapters will examine additional variables which may explain the variations in property tax levels for the municipalities.

Chapter II

THE REAL PROPERTY TAX BASE

The property tax levy is determined by two factors--the amount of revenue required and the size of the real property tax base. The purpose of this chapter is to study the composition of the real property tax base.

THE REAL PROPERTY TAX BASE--ORIGINAL ASSESSMENTS

In Alberta, the real property tax base consists of the assessed values on land, buildings, and improvements, along with pipe and power line assessments. Table 2.1 indicates that the taxable assessment on land, buildings, and improvements is the main component of the real property tax base.¹ It is also shown that the assessed value of land as a proportion of real property is greatest in the City of Edmonton. The main reason for this finding is that land assessments are based on the actual market value of land, with land prices in the city being much higher than in the surrounding municipalities.

Composition of the Real Property Tax Base

The relative importance of commercial and industrial properties as a guide for local property tax rates has been discussed in numerous

¹Also refer to the Appendix, Table 7.

TABLE 2.1

THE REAL PROPERTY TAX BASE*
 PERCENTAGE COMPOSITION
 BY SUBREGIONS, 1969

Subregion	Land	Buildings and Improvements	Pipe Line	Power Line
City of Edmonton	30.90	68.75	0.02	0.33
Inner Ring	23.94	73.88	1.25	0.94
Outer Ring	10.55	86.06	1.75	1.71
Region	16.26	80.94	1.35	1.46

*excludes exempt assessments

Source: The data were calculated from: Alberta, The Department of Municipal Affairs, Financial Statements, 1969.

studies.² The general conclusion is that commercial and industrial developments tend to lower the levels of property taxation while residential properties produce the opposite result.

For this study, the property tax base for each municipality is divided into four classes of taxable properties--residential, commercial, industrial, and vacant.³ Each component is expressed as a proportion of real property.

Figure 2.1 illustrates the composition of the real property tax base for each municipality. Large differences occur with some municipalities having an almost exclusively residential tax base while others

² Among the many articles which describe this topic, see for example: M. Beck, "Determinants of the Property Tax level: A Case Study of Northeastern New Jersey", National Tax Journal, vol. 19 (March 1966), pp. 74-77; J. J. Carroll and S. Sacks, "Influence of Industry on the Property Tax Base and the Pattern of Local Government Expenditures", Regional Science Association, 1961, p. 301; D. J. Curran "Infra-Metropolitan Competition, Land Economics, vol. 40, 1964, pp. 94-99; W. F. Hellmuth, Jr. and S. Sacks, Financing Government in a Metropolitan Area, The Cleveland Experience, New York, The Free Press of Glencoe, Inc., 1961, pp. 186-190; B. P. Herber, Modern Public Finance, Homewood, Illinois, R. D. Irwin Inc., p. 290; J. Margolis, "The Variation of Property Tax Rates Within a Metropolitan Region", National Tax Journal, vol. 9, 1956, pp. 328-330; R. L. Nelson and F. T. Aschman, Real Estate and City Planning, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1957, p. 75-76; J. P. Pickard, "Changing Urban Land Uses as Affected by Taxation", Research Monograph No. 6, Urban Land Institute, 1962, pp. 46-48.

³ The four classes are based on the following divisions:

<u>residential</u>	-- single family, multiple family, mobile homes, non-exempt institutional residences
<u>commercial</u>	-- retail shops, business offices, banks, personal and repair services, food stores, theatres, restaurants, motels and hotels, service stations, farm machinery sales, medical clinics
<u>industrial</u>	-- wholesaling, warehousing, light industry, heavy industry
<u>vacant</u>	-- not built upon but useable

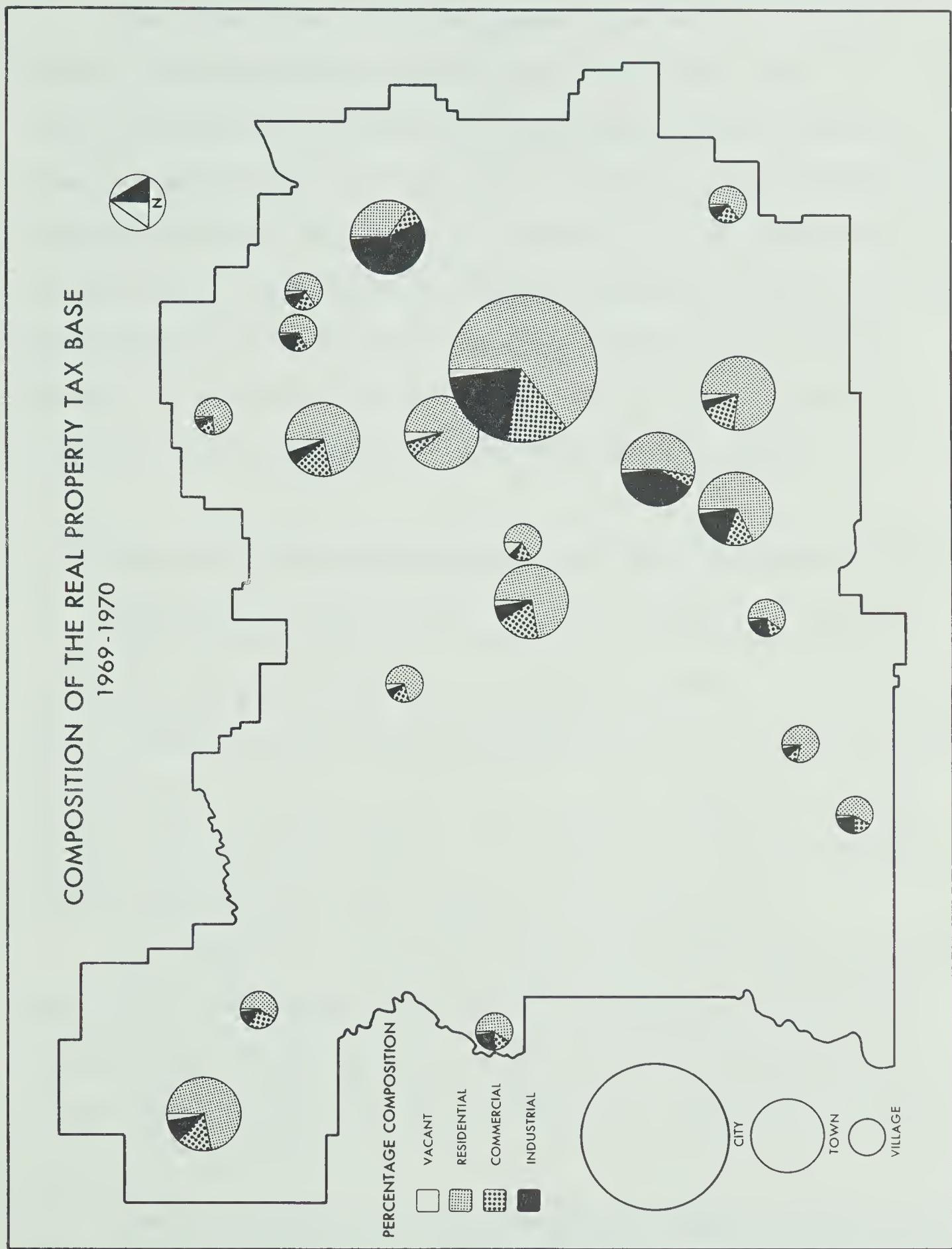


Figure 2.1

contain a larger proportion of commercial and industrial properties.

The composition of the real property tax base also displays distinct subregional characteristics (see for example Figure 2.3). All the outer ring centres have similar proportions of their property tax base composed of commercial-industrial properties. By comparison, the proportions in the inner ring vary substantially. St. Albert has only six per cent of its property tax base from commercial-industrial assessments whereas Fort Saskatchewan has over sixty per cent. The next section will study the relationship between the levels of property taxation and the composition of the real property tax base.

1) Property Tax Levels and Composition of the Real Property Tax Base.

This section examines the importance of commercial and industrial property as a determinant of property tax levels. This relationship is tested by using linear correlation analysis. The relationship is presented by drawing a graph known as a dot diagram or a scatter diagram. The dependent variable, the property tax level, is plotted on the Y-axis with the causal factor shown on the X-axis.⁴

An estimating, or regression equation is constructed to describe the functional relationship between the two variables. The straight line is fitted so that the sum of squares of the Y deviations from it is less than those from any other straight line. The fitting of such

⁴See for example: F. E. Croxton et al., Applied General Statistics, Englewood Cliffs, New Jersey, Prentice-Hall Inc., 1967, p. 389-392.

a line requires the use of the following equations:⁵

$$1. \quad \sum Y = na + b \sum X.$$

$$2. \quad \sum XY = a \sum X + b \sum X^2.$$

A valid estimate of the strength of the linear correlation between the two variables is obtained by computing the value of the Pearson linear correlation coefficient (r) for the sample. This is defined as the sum of the pair products of the two variables, in standard units, divided by the number of pairs of values of the two variables in the sample.⁶

The reliability of the estimate is determined by computing confidence limits or by applying a test of significance to the estimate. For $n = 20$, the lowest linear correlations that are significantly different from zero at specified probability levels are as follows:⁷

$r = .38$ at the 10 per cent probability level

$r = .44$ at the 5 per cent probability level

$r = .56$ at the 1 per cent probability level

In other words, a sample of 20 values drawn from an uncorrelated population would yield a value as great as .38 only 10 out of 100 times, .44 only 5 out of 100 times; and .56 only once out of 100 times.

The highest correlation recorded in Table 2.2 is between the property tax per capita and the proportion of industrial assessments

⁵Ibid., p. 393; where n corresponds to the number of samples and a and b are constants.

⁶A. L. O'Toole, Elementary Practical Statistics, New York, The MacMillan Co., 1964, p. 264.

⁷Ibid., p. 272.

($r = .622$).⁸ This finding is to be expected since it was shown in Chapter I that the property tax per capita is highly correlated with the property tax base per resident. Industrial developments result in increased amounts of property tax base per resident.

The regression equation illustrated in Figure 2.2 indicates that the City of Edmonton and the inner ring municipalities are all found above the regression line. This shows that these municipalities have higher property taxes per capita in relation to the proportion of industrial assessments than is indicated by the estimating equation.

An equally significant relationship is indicated between the effective property tax rate and the combined proportion of commercial-industrial assessments (Figure 2.3). Although the correlation ($r = -.466$) is barely significant at the 5 per cent probability level, it indicates that the communities having higher proportions of commercial-industrial assessments are usually characterized by lower effective tax rates. This relationship is also illustrated in Figure 2.4.

Exempt Property Assessments

It seems likely that the amount of exempt property assessments

⁸The following 'rules' will serve as a general guide for determining how high a correlation coefficient should be in order to be 'significant':

r from .00 to $\pm .20$	very low or negligible
r from $\pm .20$ to $\pm .40$	low; present but slight
r from $\pm .40$ to $\pm .70$	substantial or marked
r from $\pm .70$ to ± 1.00	high to very high

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF INDUSTRIAL ASSESSMENTS

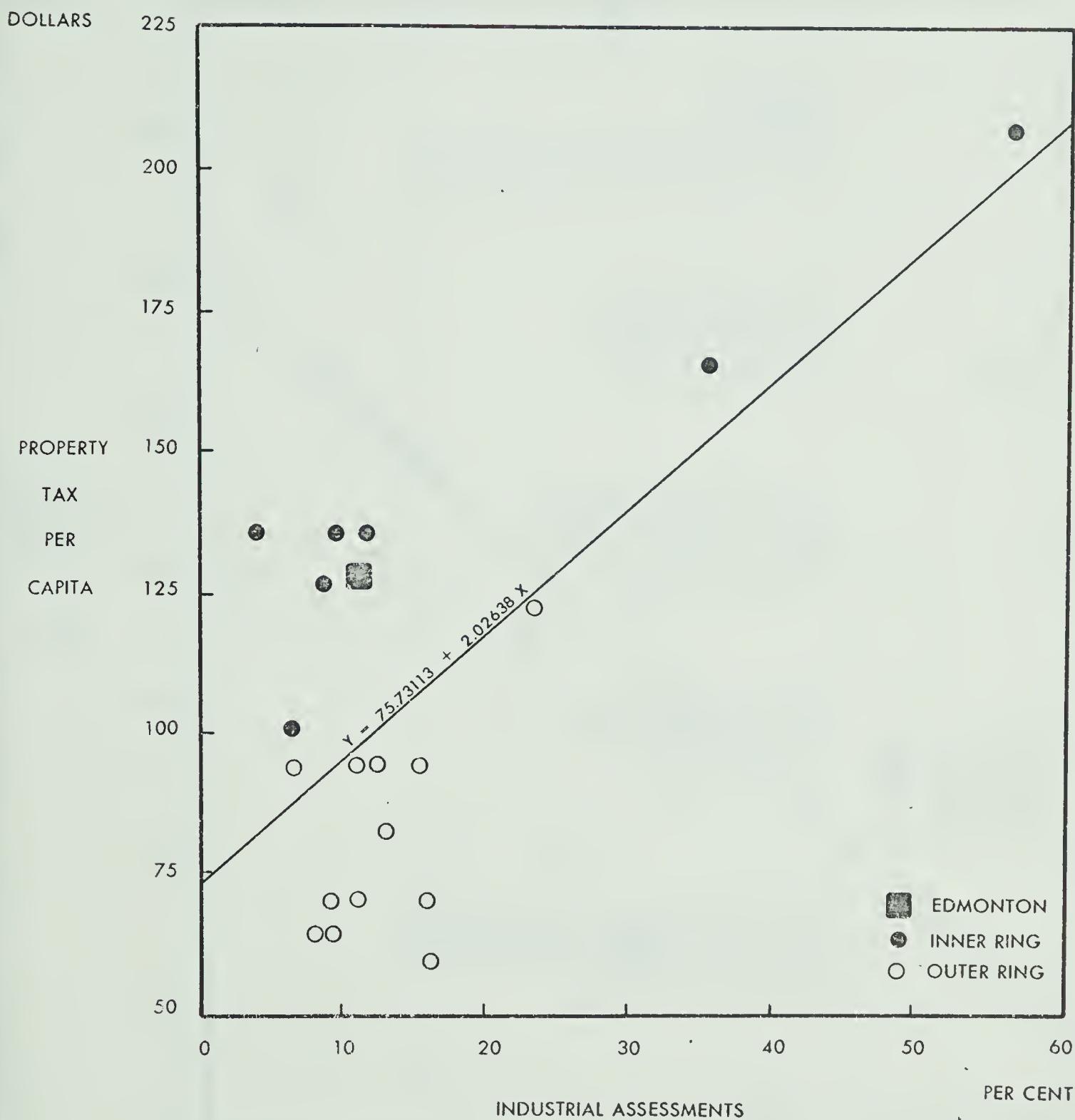


Figure 2.2

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
PROPORTION OF COMMERCIAL-INDUSTRIAL ASSESSMENTS

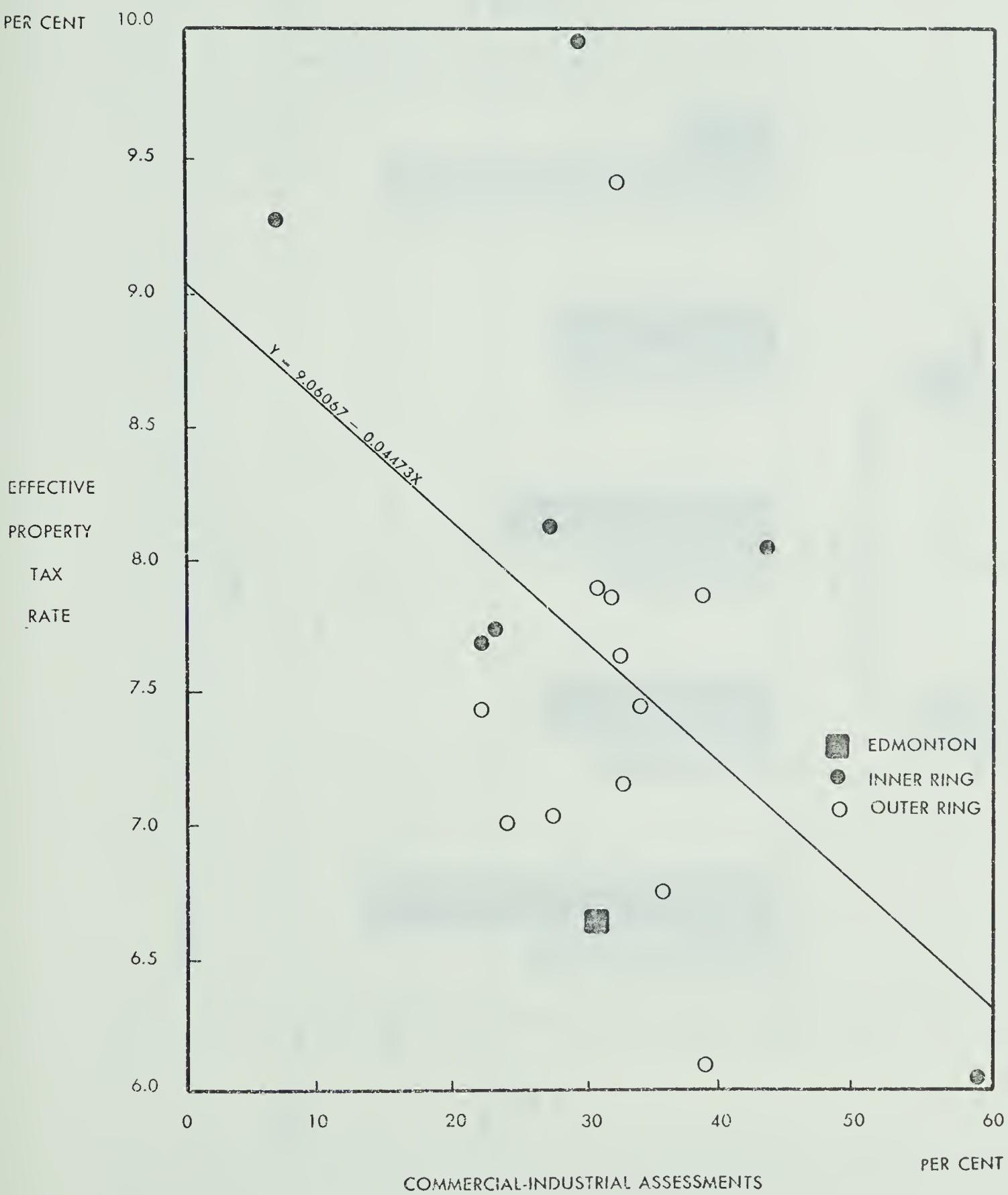
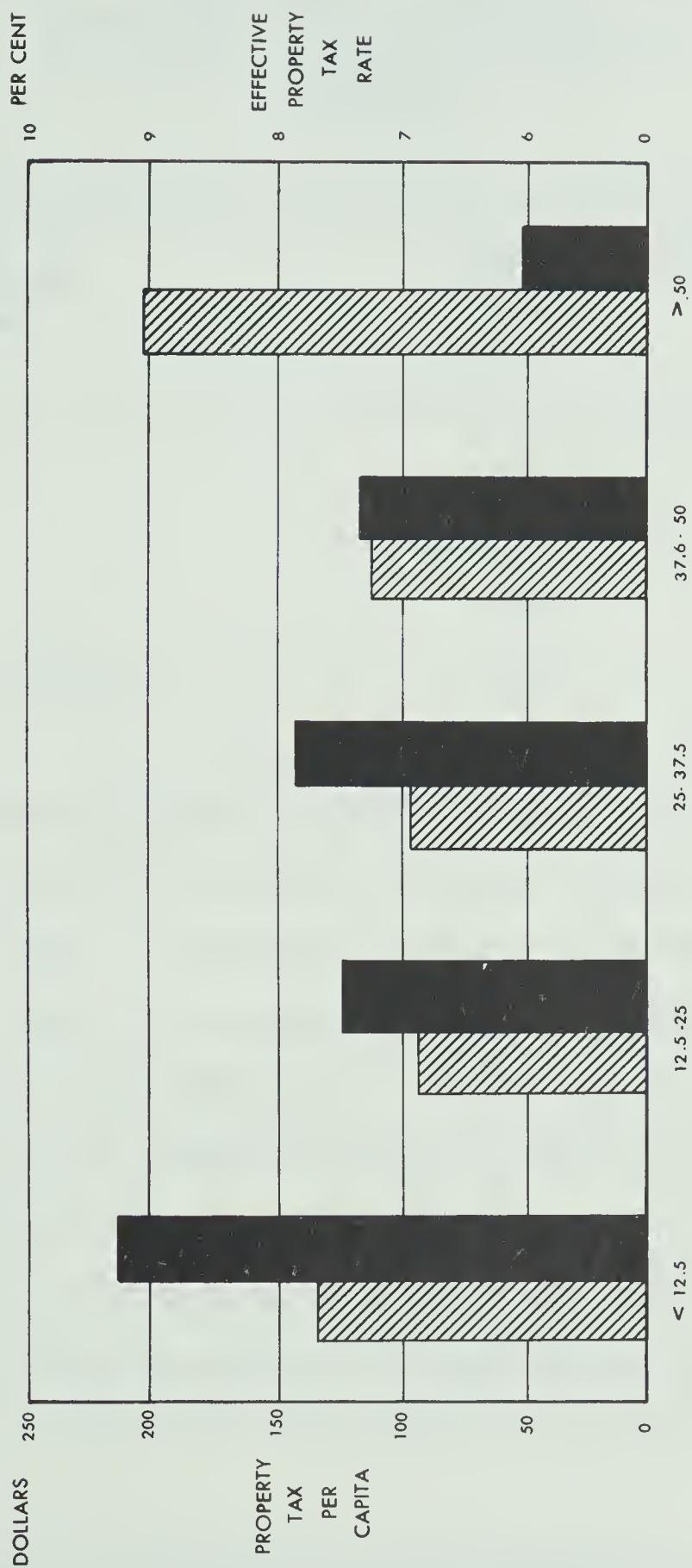


Figure 2.3

PERCENTAGE COMPOSITION OF THE REAL PROPERTY TAXABLE ASSESSMENTS
1969



COMMERCIAL-INDUSTRIAL ASSESSMENTS



Figure 2.4

TABLE 2.2

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND COMPOSITION OF
THE REAL PROPERTY TAX BASE
1969-1970

Components of the Real Property Tax Base	<u>Coefficients of Correlation</u>	
	PTC	ETR
Residential	.374	.428
Commercial	-.554	-.037
Industrial	.622	-.400
Commercial-Industrial	.348	-.466
Vacant	-.009	.321

can influence the actual levels of property taxation. A recent study in Alberta states: "Inequalities result by which some municipalities bear a very large cost of servicing exempt properties while other municipalities face minimal costs."⁹ This statement suggests that municipalities having large proportions of exempt property assessments will be characterized by higher property tax levels.

Linear correlation analyses between the property tax levels and the exempt property assessments as a proportion of total property assessments show that little association exists with either tax level

⁹Alberta Municipal Finance Study, Urban Crisis, presented by the Cities of Alberta, the Alberta Urban Municipalities Association, and the Public and Separate School Boards in each City, January 1968, p. 65.

(PTC-r = -.353; ETR-r = -.193). However, it is significant that both comparisons show an inverse relationship. One explanation for this finding is that schools, churches, government buildings, and related exempt properties may provide up to one-half of the total property assessments in some of the smaller municipalities which generally have lower property tax levels (Figure 2.5).

THE REAL PROPERTY TAX BASE--EQUALIZED ASSESSMENTS

The principal difference between the equalized assessed property base and the originally assessed base is that a number of properties are added. These are described as:

". . . those properties which are valued for 'grants in lieu of taxes' purposes but are not assessed. Similarly, where a municipality may have exempted certain property such as machinery and equipment or utility properties, they would have to be added back."¹⁰

A second type of adjustment consists of four principal steps, listed as follows:

1. Adjustments to bring all assessments based on dollars other than the 1959 Provincial Manual Dollar (75 per cent of the 1957 dollar) must be made.
2. A depreciation of building and improvements values is calculated to reduce the equalized assessment total for buildings.
3. Market values of lands and the assessment/market value ratio, of lands in all urban municipalities is determined and calculations made to adjust all urban land annually to remove variances between municipalities.
4. The urban land assessments are then reduced to represent the same proportion of their market values as building assessments are of their replacement costs.¹¹

¹⁰Report of the Special Committee Appointed by the Government of Alberta to Study Assessment and Taxation, March 1970, p. 22.

¹¹Ibid.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF EXEMPT ASSESSMENTS

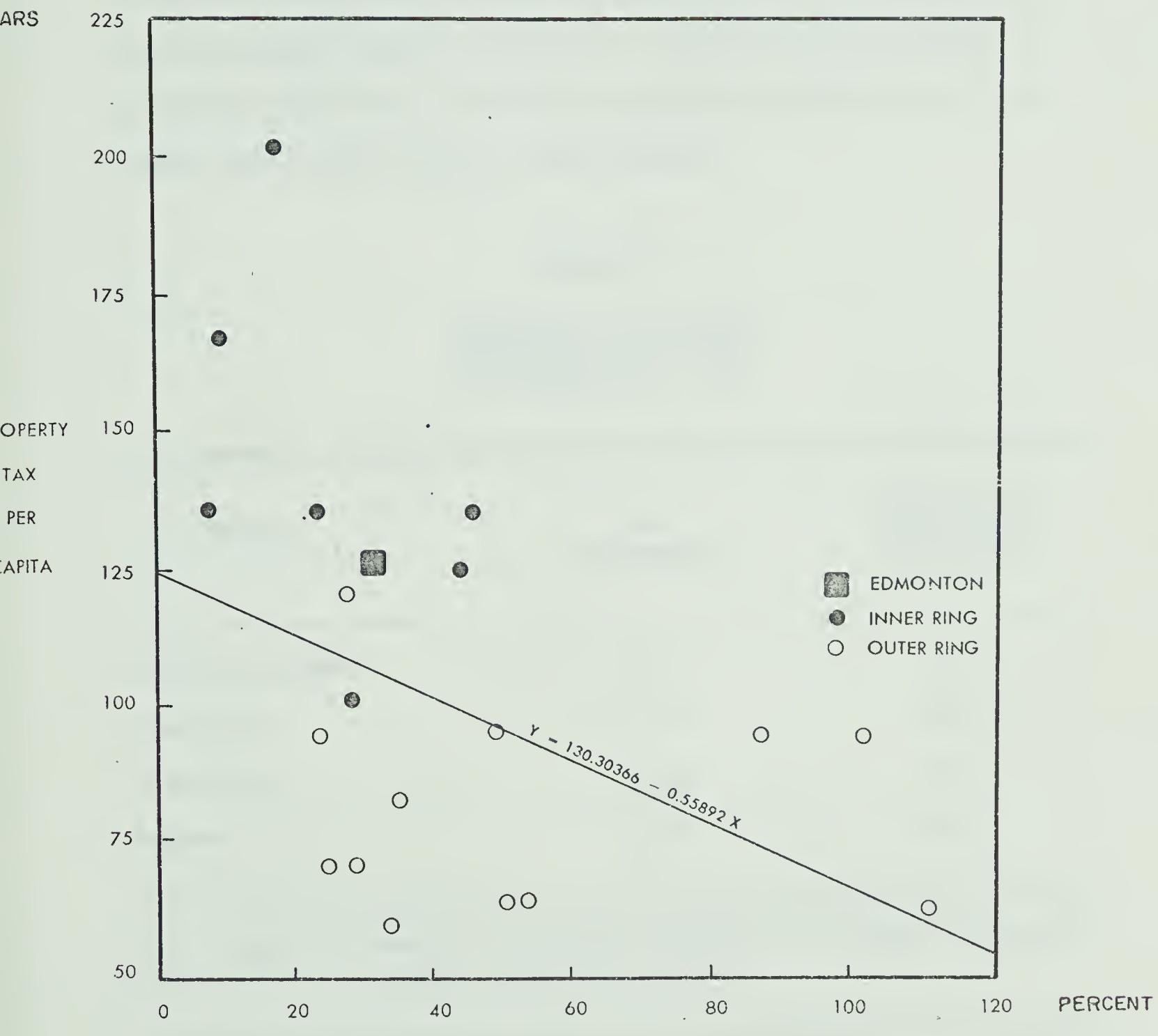


Figure 2.5

Equalized Assessments by Land-Improvement Ratios--1970

Table 2.3 lists the equalized assessments in the study area by the percentage composition of land and improvements. Distinct regional variations are depicted by this classification.¹² The proportion of total equalized property assessments composed of land valuations is greatest in the City of Edmonton since actual land values are much higher than in the remaining municipalities.

TABLE 2.3

EQUALIZED ASSESSMENTS
PERCENTAGE COMPOSITION
BY SUBREGIONS, 1970

Subregion	Land Assessments	Building and Improvement Assessments
City of Edmonton	23.41	76.59
Inner Ring	17.33	82.67
Outer Ring	8.98	91.02
Region	12.63	87.37

Source: Personal discussions with Mr. R. L. Cross, Secretary, Member of the Assessment Equalization Board.

¹²Also see Appendix, Table 9.

1) Property Tax Levels and Density of Property Values.

Previous studies have indicated that the levels of property taxation correlate with the density of property values.¹³ Two measures of the density of property values are employed in this study--the total equalized property assessments per acre and the value of equalized improvements per built-upon acre.

Table 2.4 indicates that the equalized property assessments per

TABLE 2.4

DENSITY OF PROPERTY VALUES
BY SUBREGIONS, 1970

Subregion	Equalized Assessments Per Acre (Dollars)	Equalized Value of Improvements Per Built-Upon Acre (Dollars)
City of Edmonton	\$15,141.71	\$24,949.18*
Inner Ring	3,477.66	12,293.95
Outer Ring	3,072.95	8,897.63
Region	3,823.04	10,988.93

*1969 built-upon area projected from the 1961 data.

Source: The equalized assessments were obtained from Mr. R. L. Cross, Secretary, Member of the Assessment Equalization Board; land-use calculations were based on land-use maps and data from the Provincial Planning Branch and the Edmonton Regional Planning Commission.

¹³This subject is discussed by: M. Beck, op. cit., p. 75; J. P. Pickard, op. cit., p. 37.

acre are substantially greater in the City of Edmonton. This pattern is to be expected since the city is characterized by more intensive land-use patterns and performs more specialized functions.

Little correlation is found between the levels of property taxation and the equalized property assessments per acre (Table 2.5). Two explanations may be offered. The obvious deduction is that the density of property values are of little importance in explaining variations in property taxation between the municipalities. A second explanation is that the equalized property assessments per acre are not a very accurate measure of the density of property values.

TABLE 2.5

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND THE DENSITY OF PROPERTY VALUES
1969-1970

Density Measure	<u>Coefficients of Correlation</u>	
	PTC	EFR
Equalized Assessment Per Acre	.325	-.411
Equalized Value of Improvements Per Built-Upon Acre	.631	-.477

The value of equalized improvements per built-upon acre is a more refined measure of the density of property values since consideration is given only to the developed areas within a municipality.

Figures 2.6 and 2.7 indicate that the City of Edmonton and the inner

ring municipalities generally have the highest values of equalized improvements per built-upon acre. The logical explanation is that these municipalities are characterized by more intensive forms of land-use.

The most important finding is that the equalized improvements per built-upon acre are definitely associated with the levels of property taxation. Figure 2.6 shows that high property taxes per capita are generally accompanied by high values of equalized improvements per acre. The municipalities having the highest density of property values generally also have the highest property taxes per capita.

The relationship shown in Figure 2.7 indicates that the municipalities having increased values of equalized improvements per built-upon acre are generally characterized by lower effective tax rates. Two additional items are noted. A wide range in values is displayed between the municipalities with the correlation coefficient being only barely significant at the five per cent probability level ($r = -.477$).

A second observation is that distinct subregional patterns exist. A majority of the outer ring municipalities fall below the estimating equation while most of the inner ring municipalities are above the line. Estimates of the effective tax rate would usually be too high for the outer ring municipalities and too low for the inner ring municipalities. The City of Edmonton is situated on the regression line and indicates that its effective tax rate as determined by the value of equalized improvements per built-upon acre is comparable to the average of all the municipalities.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
IMPROVEMENTS PER BUILT-UPON ACRE

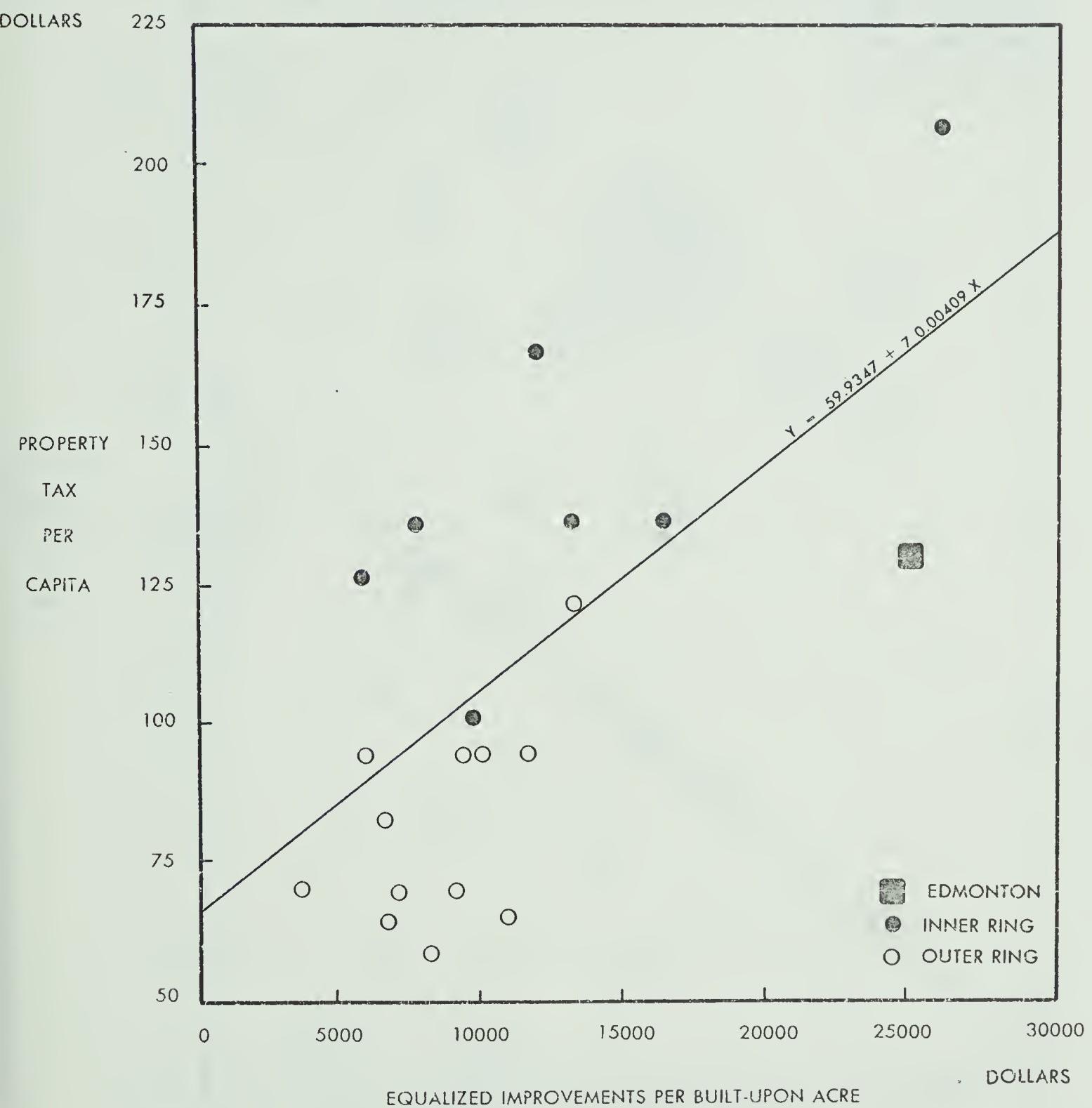


Figure 2.6

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
EQUALIZED IMPROVEMENTS PER BUILT-UPON ACRE

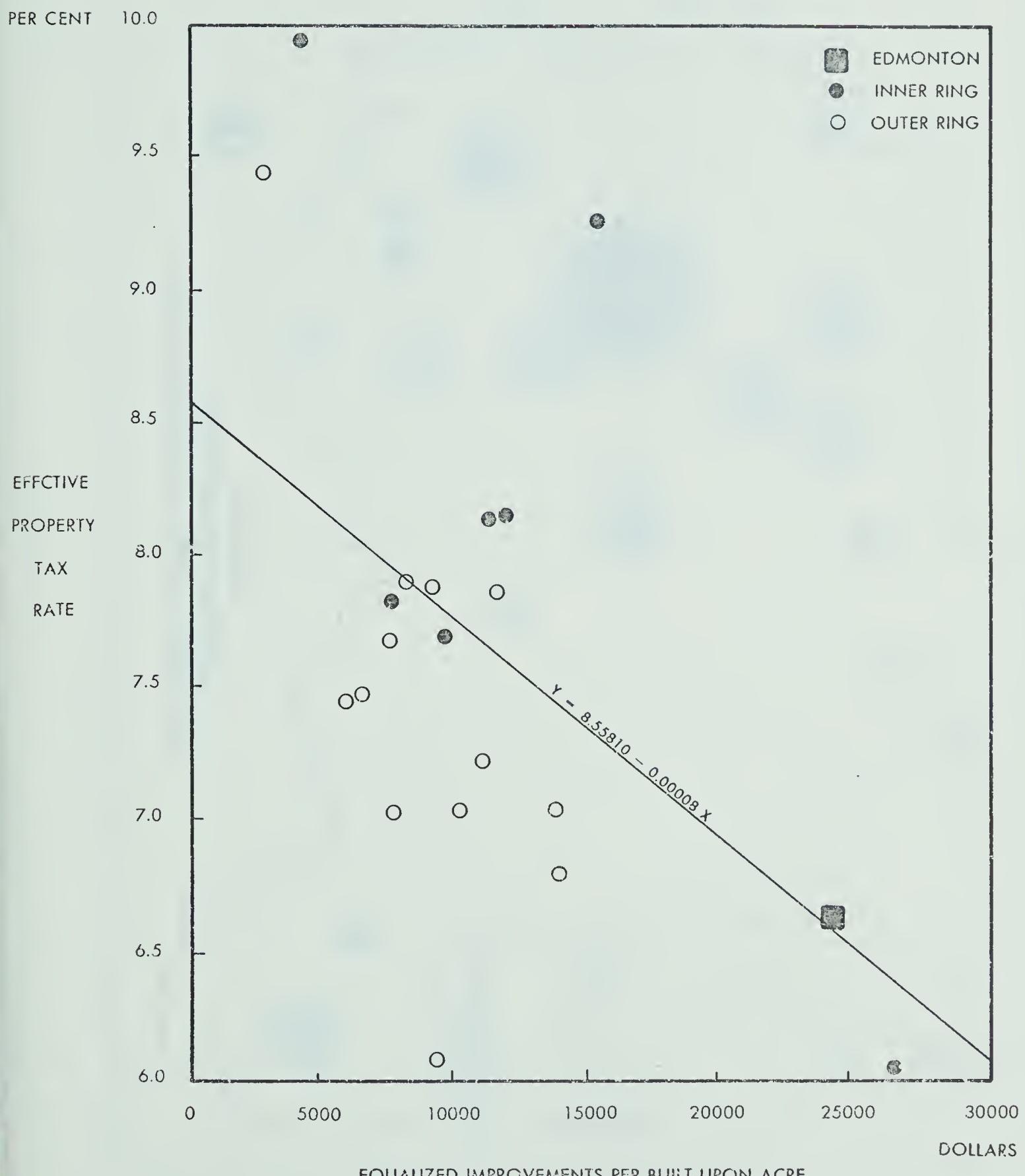


Figure 2.7

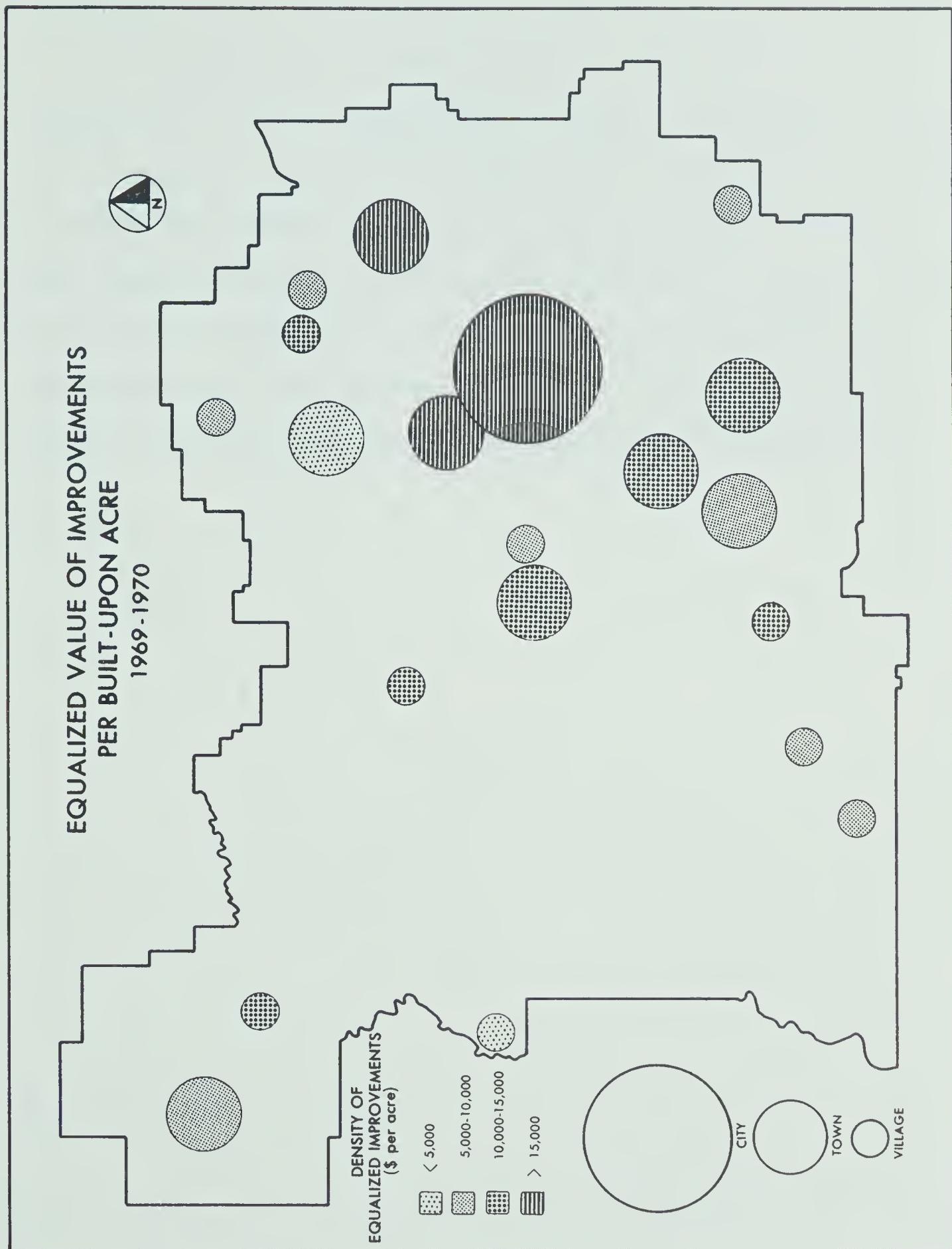


Figure 2.8

CONCLUSION

The results of this chapter indicate that a municipality's property tax level is associated with various characteristics of its real property tax base. It was shown that variations in the level of property taxation were associated with the proportions of commercial and industrial property in the taxable assessments. A second conclusion was that both indices of property taxation were influenced by the density of property values, particularly when a comparison was made with the equalized value of improvements per built-upon acre.

Chapter III

MUNICIPAL FISCAL PATTERNS

The purpose of this chapter will be to study the relationship between levels of property taxation and the revenue-expenditure patterns for the urban municipalities. Previously, it was stated that the property tax level was determined by two factors--the amount of revenue required and the size of the property tax base. The present analysis will study local expenditures, the real property tax as a proportion of total municipal revenues, the availability of non-property tax revenues, the amount of capital assets, and the existing municipal debenture debts.

CURRENT EXPENDITURES

Current Expenditures Per Capita

A summary of the total current expenditures per capita by sub-regions is listed in Table 3.1. The City of Edmonton has the highest level of per capita expenditures, followed by the inner ring municipalities (Figure 3.1). One of the most important features of the per capita expenditures listed in Table 3.1 is the substantial increase which has occurred for all three subregions during 1964-1969. The Economic Council of Canada summarizes the financial implications of urban growth as follows:

The prolonged expansion in municipal expenditures has been based on a combination of factors including the backlog of projects deferred during the Depression and the war, rising average incomes, and the particularly rapid growth in the population classes requiring the largest proportion of municipally supported services, notably school-age children.¹

The municipalities in the Edmonton Regional Planning Commission have also been characterized by these trends.²

Table 3.2 lists various selected components of the current expenditures on a per capita basis.³ Education expenditures form the biggest proportion of total expenditures.⁴ The City of Edmonton has the highest per capita expenditures in three categories--protection to persons and property,⁵ education,⁶ and recreation and community purposes.⁷ The inner ring municipalities are faced with higher expendi-

¹Economic Council of Canada, 4th Annual Review, The Canadian Economy from the 1960's to the 1970's, September, 1967, p. 216.

²See Chapters IV and V.

³Current expenditures include the following categories: general government, protection to persons and property, public works, sanitation and waste removal, health, social welfare, education, recreation and community services, debt charges, utilities and other municipal enterprises, provision for reserves, contributions to general capital and loan funds, joint or special expenditures and miscellaneous as listed in Canada, The Dominion Bureau of Statistics, Municipal Finance Reporting Manual, Ottawa, Queen's Printer, 1960, p. 87.

⁴Also refer to the Appendix Table 9.

⁵This category includes: fire protection, police protection, law enforcement, corrections, protective inspections, street lighting, destruction of pests, other protection as listed in Canada, The Dominion Bureau of Statistics, op. cit., p. 87.

⁶This category includes: elementary (public or separate school authority requisition), secondary, technical or vocational schools, other expenditures; Ibid., p. 87.

⁷This category includes: special activities--contributions,

TABLE 3.1

CURRENT EXPENDITURES PER CAPITA
BY SUBREGIONS, 1964 AND 1969

Subregion	Current Expenditures Per Capita, 1964 (Dollars)	Current Expenditures Per Capita, 1969 (Dollars)
City of Edmonton	168.45	255.04
Inner Ring	140.15	222.21
Outer Ring	110.80	152.78
Region	124.96	180.85

Source: The calculations were made from information published in: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

tures per capita in government administrative categories⁸ and public works requirements.⁹

levies and deficits, recreation services, other community services; Ibid., p. 87.

⁸This category includes: executive and legislative, administrative, and other general government expenditure; Ibid., p. 87.

⁹This category includes: streets, roads, bridges, etc., other public works; Ibid., p. 87.

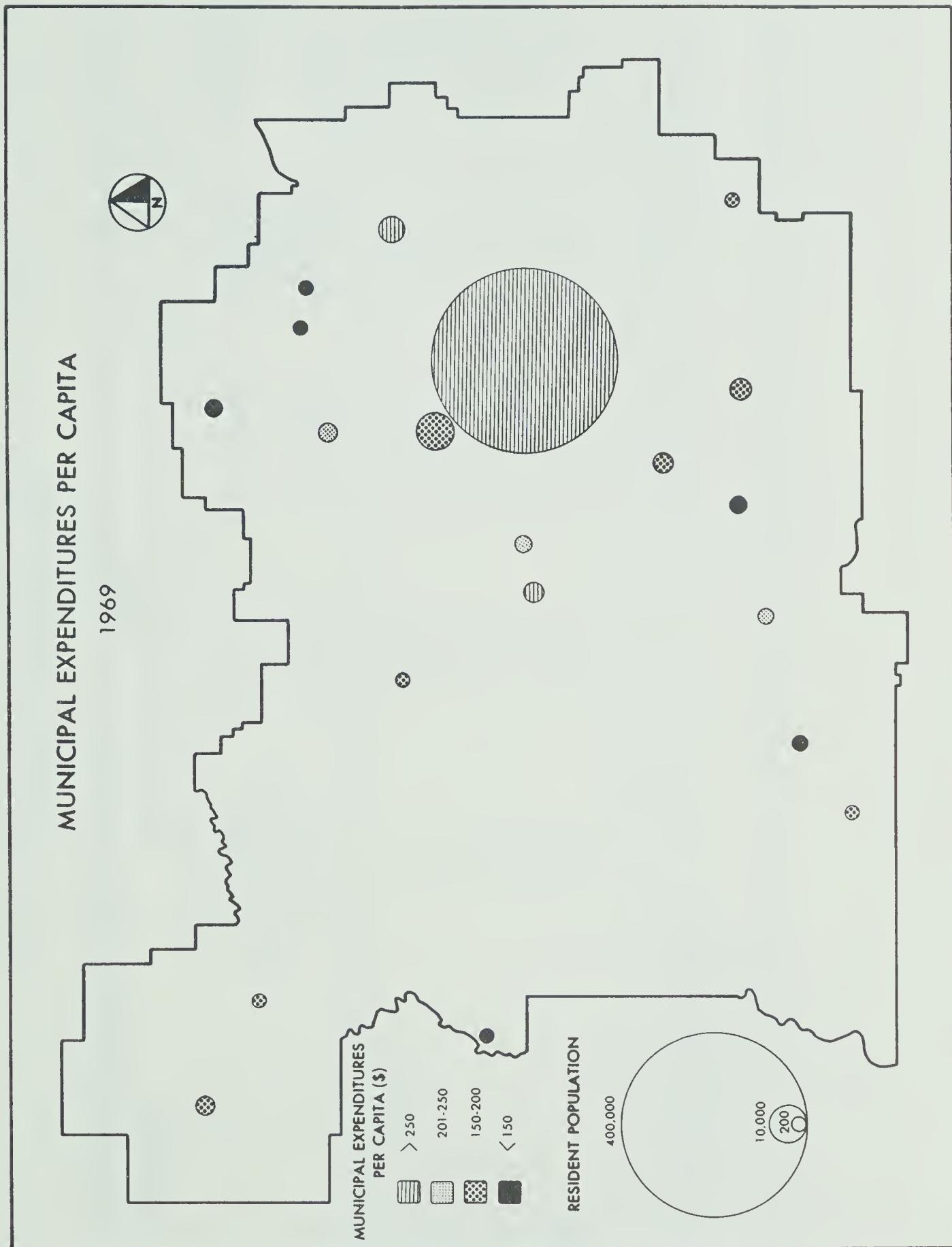


Figure 3.1

TABLE 3.2

SELECTED COMPONENTS OF CURRENT EXPENDITURES PER CAFITA
BY SUBREGIONS, 1969

Subregion	Selected Components of Current Expenditures Per Capita				
	Government Administrative (Dollars)	Protection (Dollars)	Public Works (Dollars)	Recreation and Community (Dollars)	Education (Dollars)
City of Edmonton	9.44	43.22	7.82	20.16	84.20
Inner Ring	18.23	14.23	17.39	14.76	76.21
Outer Ring	12.39	8.92	15.07	3.54	48.30
Region	14.28	12.49	15.52	8.30	59.86

Source: The data were calculated from; Alberta, The Department of Municipal Affairs,
Financial Statements, 1969.

1) Property Tax Per Capita and Current Expenditures. A summary of the correlation coefficients comparing the property tax per capita and current expenditures per capita is shown in Table 3.3. A high positive correlation ($r = .808$) is found between the property tax per capita and the total current expenditures per capita. This relationship is also illustrated in Figure 3.2 with most municipalities being located near the estimating equation. A second observation from this diagram is

TABLE 3.3
COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND MUNICIPAL EXPENDITURES, 1969

Components of Municipal Expenditures	Coefficients of Correlation	
	PTC	ETR
General Government	.463	.681
Protection to Persons and Property	.380	-.065
Public Works	.202	.269
Recreation and Community	.680	.147
Education	.936	.200
Total Expenditures	.808	.465

that two inner ring municipalities, Fort Saskatchewan and St. Albert, have the highest municipal expenditures per capita, followed by the City of Edmonton.

The correlation analysis shows that a definite association exists between the property tax per capita and the current expenditures per capita. The next section will study the relationship between the

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
CURRENT EXPENDITURES PER CAPITA

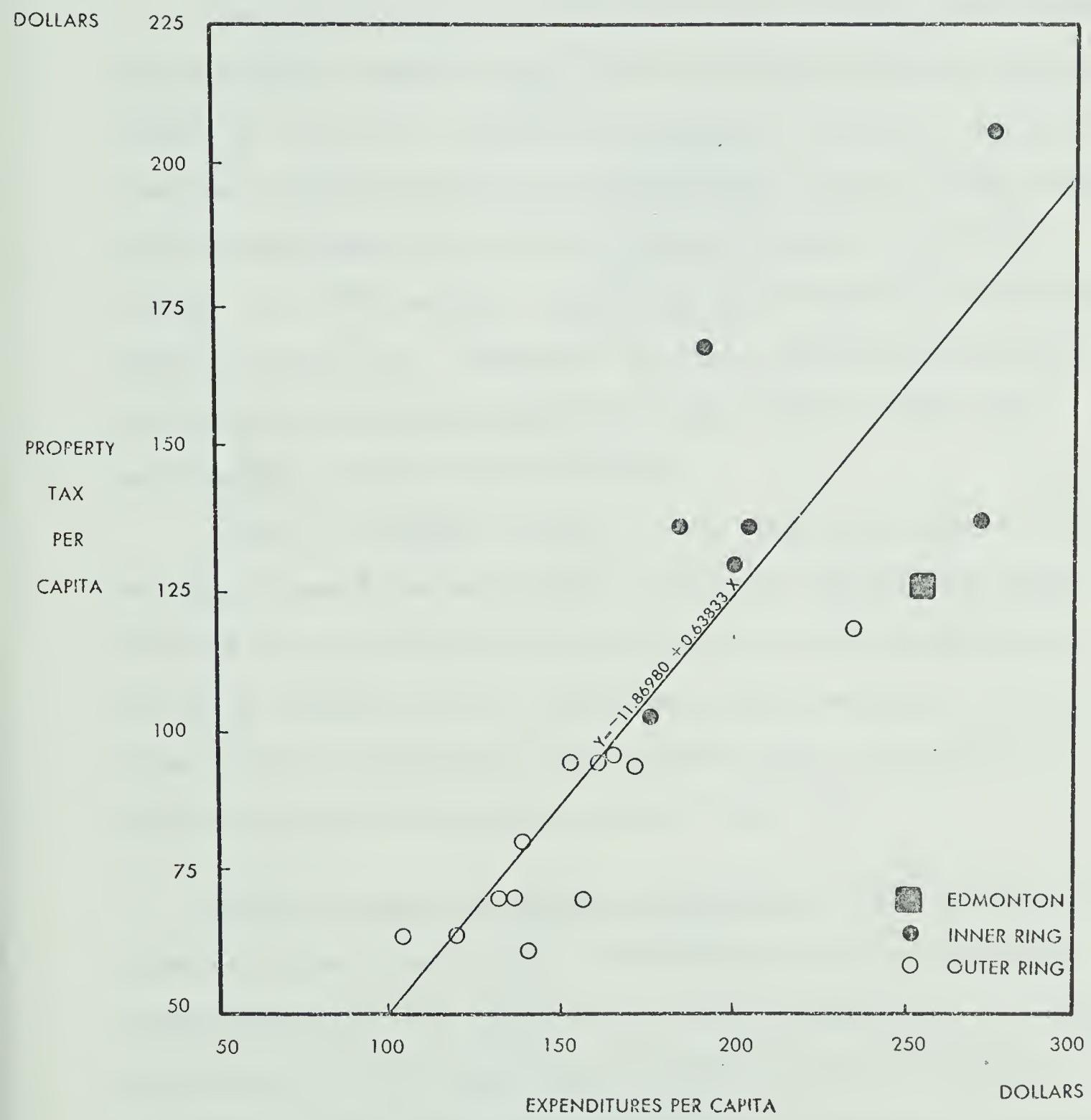


Figure 3.2

effective tax rate and the current expenditures per \$1,000 of equalized property assessments.

Current Expenditures Per Equalized Property Assessments

Less disparity exists between the three subregions when municipal expenditures are expressed per \$1,000 of equalized property assessments (Tables 3.1 and 3.4). One important difference between the two classifications is that the outer ring municipalities have the highest average current expenditures per \$1,000 of equalized property assessments (Figure 3.3). This pattern is generally also illustrated by the scatter diagram (Figure 3.4). Indications are that these municipalities are characterized by greater expenditure burdens than the inner ring municipalities and the City of Edmonton.

Table 3.5 provides a summary of the selected components of the municipal expenditures per \$1,000 of equalized property assessments. Probably the most significant item to be noted is the similarity in education costs per \$1,000 of equalized property assessments for all three subregions, especially since education costs per capita are characterized by a wide range of values (Table 3.2).

- 1) Effective Tax Rate and Current Expenditures. Table 3.3 lists the correlation coefficients between the effective tax rate and current expenditures per \$1,000 of equalized property assessments. A positive correlation is shown between the effective tax rate and the total expenditures per \$1,000 of equalized property assessments although the coefficient is only barely significant at the five per cent probability

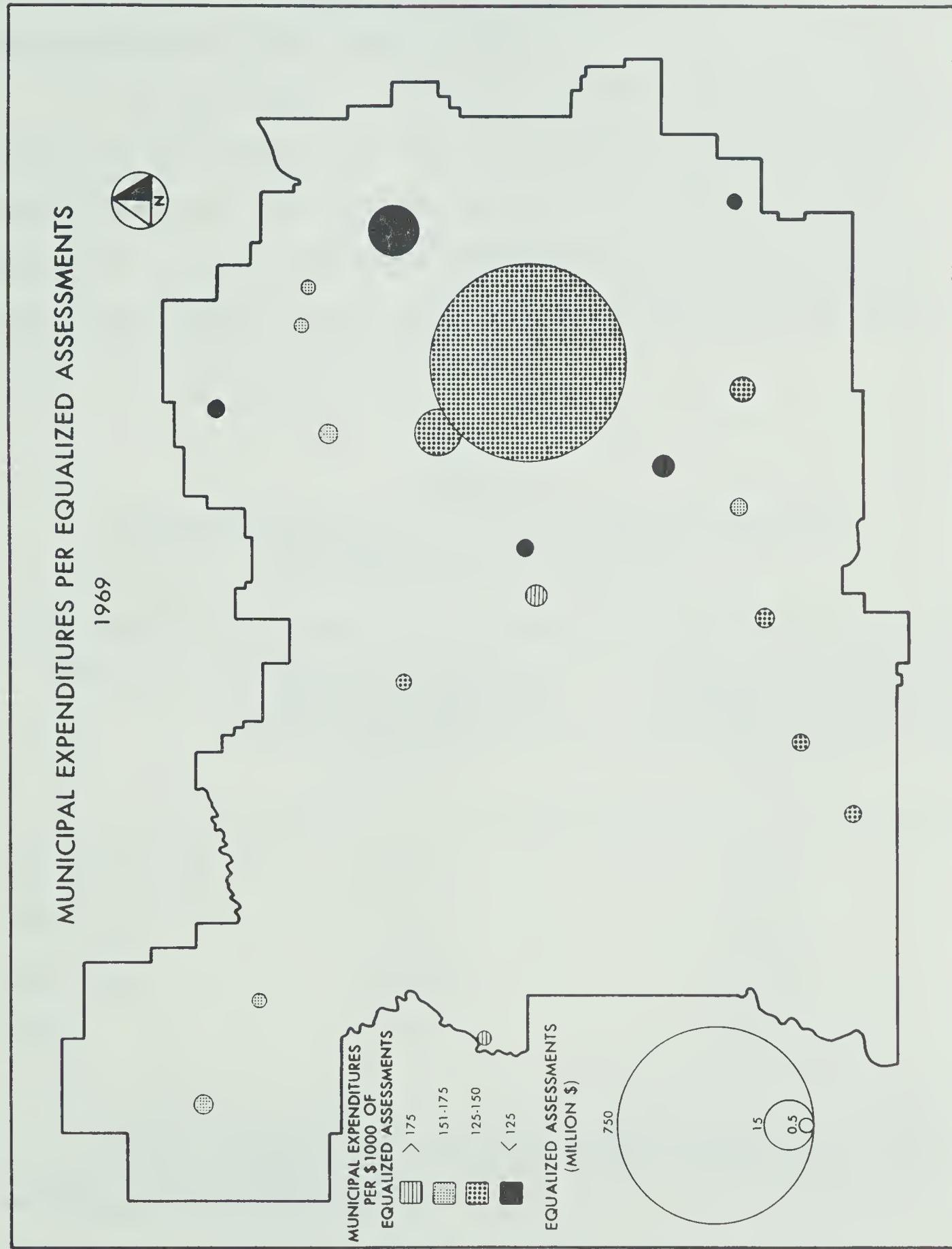


Figure 3.3

level. Figure 3.4 shows that most of the inner ring municipalities are located above the regression line whereas the majority of the outer ring municipalities are found below the line.

It has been shown in the analysis that both the property tax per capita and the effective tax rate are associated with total current expenditures. One reason for this finding is that the size of the property tax levy is partially determined by the amount of municipal expenditures required. The next section will examine other sources of revenue available to each municipality.

TABLE 3.4

CURRENT EXPENDITURES PER \$1,000 OF EQUALIZED TAX BASE
BY SUBREGIONS, 1964 AND 1969

Subregion	Current Expenditures Per \$1,000 Equalized Property Assessments, 1964 (Dollars)	Current Expenditures Per \$1,000 Equalized Property Assessments, 1969 (Dollars)
City of Edmonton	108.43	137.10
Inner Ring	91.02	129.07
Outer Ring	108.06	148.21
Region	102.12	140.95

Source: The calculations were made from information published in: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
CURRENT EXPENDITURES PER \$1000 EQUALIZED ASSESSMENTS

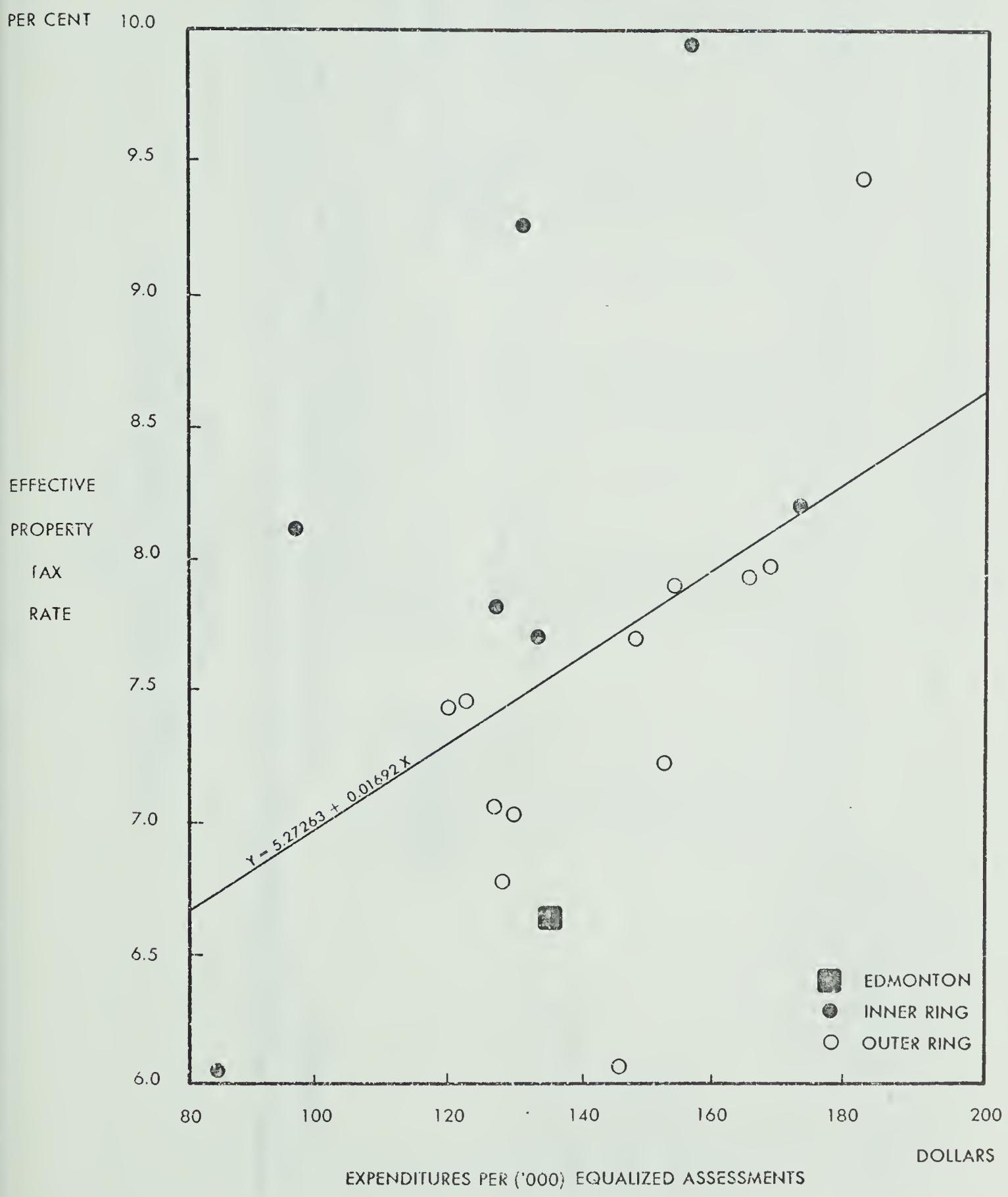


Figure 3.4

TABLE 3.5

SELECTED COMPONENTS OF CURRENT EXPENDITURES
PER \$1,000 OF EQUALIZED TAX BASE
BY SUBREGIONS, 1969

Subregion	Selected Components of Current Expenditures Per \$1,000 of Equalized Property Assessments			
	Government Administrative (Dollars)	Protection (Dollars)	Public Works (Dollars)	Recreation and Community (Dollars) (Dollars)
City of Edmonton	5.08	23.26	4.21	10.85
Inner Ring	10.90	8.75	9.77	8.18
Outer Ring	12.21	8.30	15.68	3.22
Region	11.40	9.21	13.04	5.33

Source: The data were calculated from: Alberta, The Department of Municipal Affairs,
Financial Statements, 1969.

CURRENT REVENUES

The major problem of municipal finance is to obtain sufficient revenues to maintain the standard of services the community expects or which the municipal corporation is required to supply. A second aspect is to find revenues which have both the stability to maintain essential services under adverse economic conditions and the flexibility to make possible the adjustment of revenues to changing demands and varying economic conditions.¹⁰

The four main sources of municipal revenues are: (1) taxation, (2) grants, subsidies, and shared taxes, (3) earnings from municipal enterprises, and (4) miscellaneous revenues.¹¹ Two aspects of municipal revenues will be examined in this section: the real property tax as a proportion of total municipal revenues; and the amount of contributions, grants, and subsidies received by each municipality.

The Real Property Tax as a Proportion of Municipal Revenue

Table 3.6 indicates that the real property tax as a proportion of total municipal revenue for the region has declined from 61.01 per cent in 1964 to 55.05 per cent in 1969 with the major decline occurring in the outer ring municipalities. The inner ring municipalities are generally much more dependent on the property tax as a source of revenue than the remaining municipalities (Figures 3.5 and 3.6).

¹⁰K. G. Crawford, Canadian Municipal Government, Toronto, University of Toronto Press, 1968, p. 206.

¹¹Ibid., p. 206.

TABLE 3.6

SELECTED COMPONENTS OF MUNICIPAL REVENUE
BY SUBREGIONS, 1964 AND 1969

Subregion	Real Property Tax 1964	Percentage Composition of Municipal Revenue		
		Real Property Tax 1969	Contributions, Grants and Subsidies 1964	Contributions, Grants and Subsidies 1969
City of Edmonton	47.19	48.45	24.81	26.63
Inner Ring	65.20	63.00	13.89	11.09
Outer Ring	59.71	50.97	14.81	14.30
Region	61.01	55.05	14.99	13.98

Source: The calculations were made from information published in: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

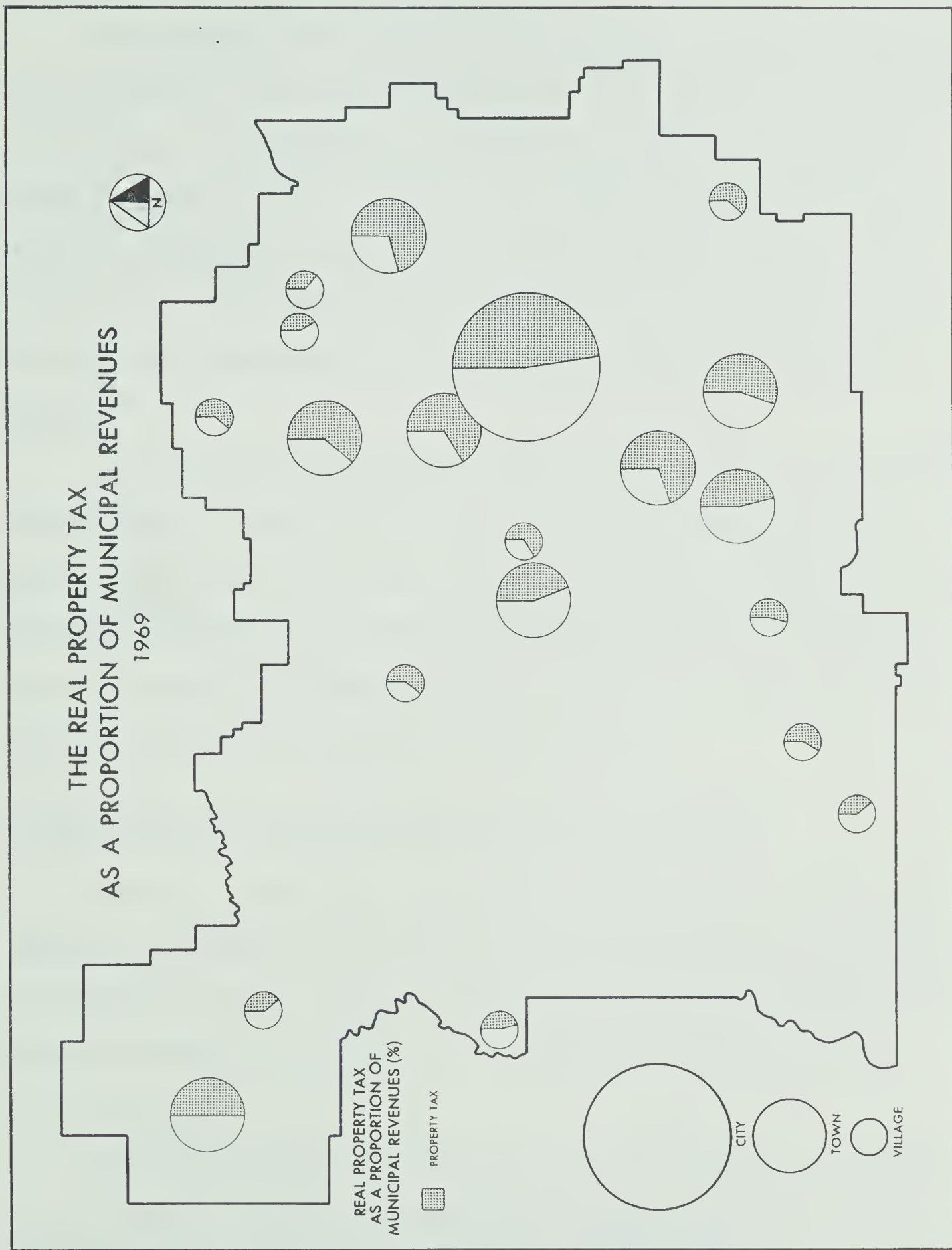


Figure 3.5

Grants, Contributions and Subsidies

An important factor influencing the levels of property taxation is the availability of non-tax revenues; these are summarized under "grants, contributions, and subsidies".¹² Provincial grants are administered through a series of Acts, including the Municipalities Assistance Act, the Public Welfare Assistance Act, and the Provincial Crown Property Grants Act.¹³ Additional municipal revenues are obtained from utility enterprises, contributions in lieu of taxes, and a number of other sources.¹⁴

A summary of the percentage of contributions, grants, and subsidies for 1964-1969 is listed in Table 3.6. The City of Edmonton has the highest percentage of this form of municipal revenue. Subsequent investigation indicated that this pattern was attributable to large revenues obtained through the operation of its own utilities, in particular from municipal revenues appropriated in lieu of taxes.

Property Tax Levels and Composition of Municipal Revenues

Table 3.7 shows that a substantial association ($r = .695$) exists between the property tax per capita and the property tax as a proportion of municipal revenue. Communities characterized by a high dependency on the real property tax as a source of revenue also tend to have high

¹²Canada, The Dominion Bureau of Statistics, op.cit., pp. 95-96.

¹³See for example: Alberta, The Department of Municipal Affairs, Annual Yearbooks, "Contributions, Grants, and Subsidies".

¹⁴Ibid.

TABLE 3.7
COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND MUNICIPAL REVENUES, 1969

Components of Municipal Expenditures	Coefficients of Correlation	
	PTC	ETR
Real Property Tax	.695	.169
Contributions, Grants and Subsidies	-.386	-.262

property taxes per capita. Figure 3.6 illustrates that the outer ring municipalities are characterized by smaller proportions of their municipal revenue coming from the real property taxes. The inner ring municipalities generally have higher proportions of their municipal revenues from the real property tax. One explanation for this development is that the inner ring municipalities are faced with higher education costs which are requisitioned from the real property tax.

Relatively weak associations are indicated between the proportion of municipal revenue composed of grants, contributions, and subsidies and both indices of property taxation (Table 3.7). It appears that increased proportions of non-property tax revenues are accompanied by a lowering of the levels of property taxation.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
REAL PROPERTY TAX AS A PROPORTION OF CURRENT REVENUE

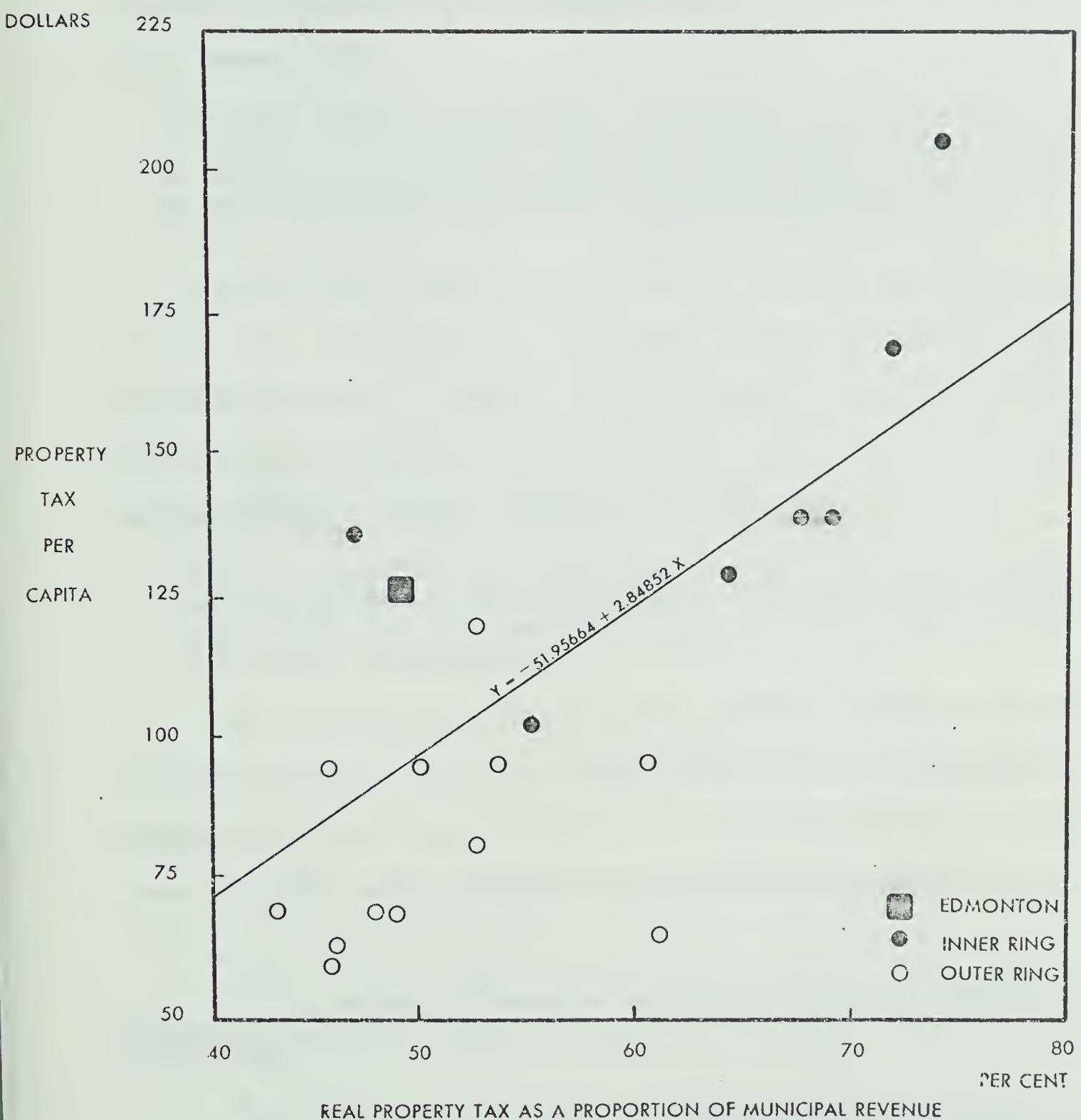


Figure 3.6

CAPITAL EXPENDITURES

The purpose of this section is to focus upon the municipal debt incurred by the municipalities. The recent patterns of municipal growth have imposed a serious strain on the local financial operations.

E. J. Hanson states:

The municipalities of Alberta, like those in other Canadian Provinces, are operating under great fiscal constraints. They have a multitude of functions to perform in a growing, industrializing, urbanizing economy but possess revenue sources which impose serious limits upon their capacity to provide required services.¹⁵

Rapid urban growth has necessitated a substantial increase in local capital expenditures. The current shortage of funds has forced many municipalities to resort to long-term borrowing with the taxpayer having to pay for both the capital debt and the interest which accrues on the principal. Seymour Sacks and W. F. Hellmuth Jr. state:

Many justifications have been presented for using borrowing as a source of funds for local government. The most commonly accepted idea is that long-term borrowing should be used in conjunction with capital expenditures.¹⁶

Two variables will be used in the analysis with the levels of property taxation. The first category consists of a municipality's general fixed assets and consists of the capital investments in such items as public works projects and sanitation facilities.¹⁷

¹⁵ E. J. Hanson, "Financing Education in Alberta", Research Monograph No. 11, The Alberta Teachers' Association, Edmonton, March 1966, p. 46.

¹⁶ S. Sacks, W. F. Hellmuth Jr., Financing Government in a Metropolitan Area, The Cleveland Experience, New York, The Free Press of Glencoe, Inc., 1961, p. 24.

¹⁷ The accounts listed in the Annual Yearbooks use the following

An analysis will also be conducted between the property tax and the proportion of the general unmatured debenture debt for the municipality at large.¹⁸ This category is based on the debenture debts which have been issued to provide for sewers, sidewalks, and other projects which are financed by the municipality. The debenture debt related to public utilities is not considered in this study since the quality of the water supply system, which is usually the major component of the public utility debt, varies widely for these municipalities.

Capital Expenditures Per Capita

Table 3.8 lists the fixed capital assets per capita and the municipal debenture debt per capita by subregions for 1964 and 1969. The value of fixed assets per capita for the region has increased from \$320.07 in 1964 to \$427.40 in 1969. The municipal debenture debt per capita increased from \$86.26 in 1964 to \$103.11 in 1969. The average value of fixed assets per capita is highest in the inner ring subregion. The City of Edmonton has the highest amount of debenture debts per capita. Tables 10 and 11 in the Appendix show that a wide range in

subcategories: general government, protection to persons and property, public works, sanitation and waste removal, health, social welfare, recreation services, community services, and miscellaneous. The City of Edmonton follows a policy whereby fixed assets are depreciated which yields a deflated valuation in relation to the other municipalities.

¹⁸ The debenture debt is listed in two sections--general debt and public utilities. A further classification divides the debenture debt into two categories--the municipality's share and the property owner's share. The general debt consists of three headings--sewers, sidewalks, and "other". The public utilities debenture debts are also listed under three headings--water supply system, electric light and power system, and natural gas system. See for example: Alberta, The Department of Municipal Affairs, Annual Yearbook, "Analysis of Gross Unmatured Debenture Debt".

TABLE 3.8

SELECTED INDICES OF THE CAPITAL ACCOUNTS, PER CAPITA,
BY SUBREGIONS, 1964 AND 1969

Subregion	Fixed Assets Per Capita	Fixed Assets Per Capita	Municipal Debenture Debt Per Capita	Municipal Debenture Debt Per Capita
	1964 (Dollars)	1969 (Dollars)	1964 (Dollars)	1969 (Dollars)
City of Edmonton	333.12	376.03	254.38	346.31
Inner Ring	392.87	530.33	112.97	126.25
Outer Ring	272.55	371.64	53.97	59.55
Region	320.07	427.40	86.26	103.11

Source: The calculations were made from information published in: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

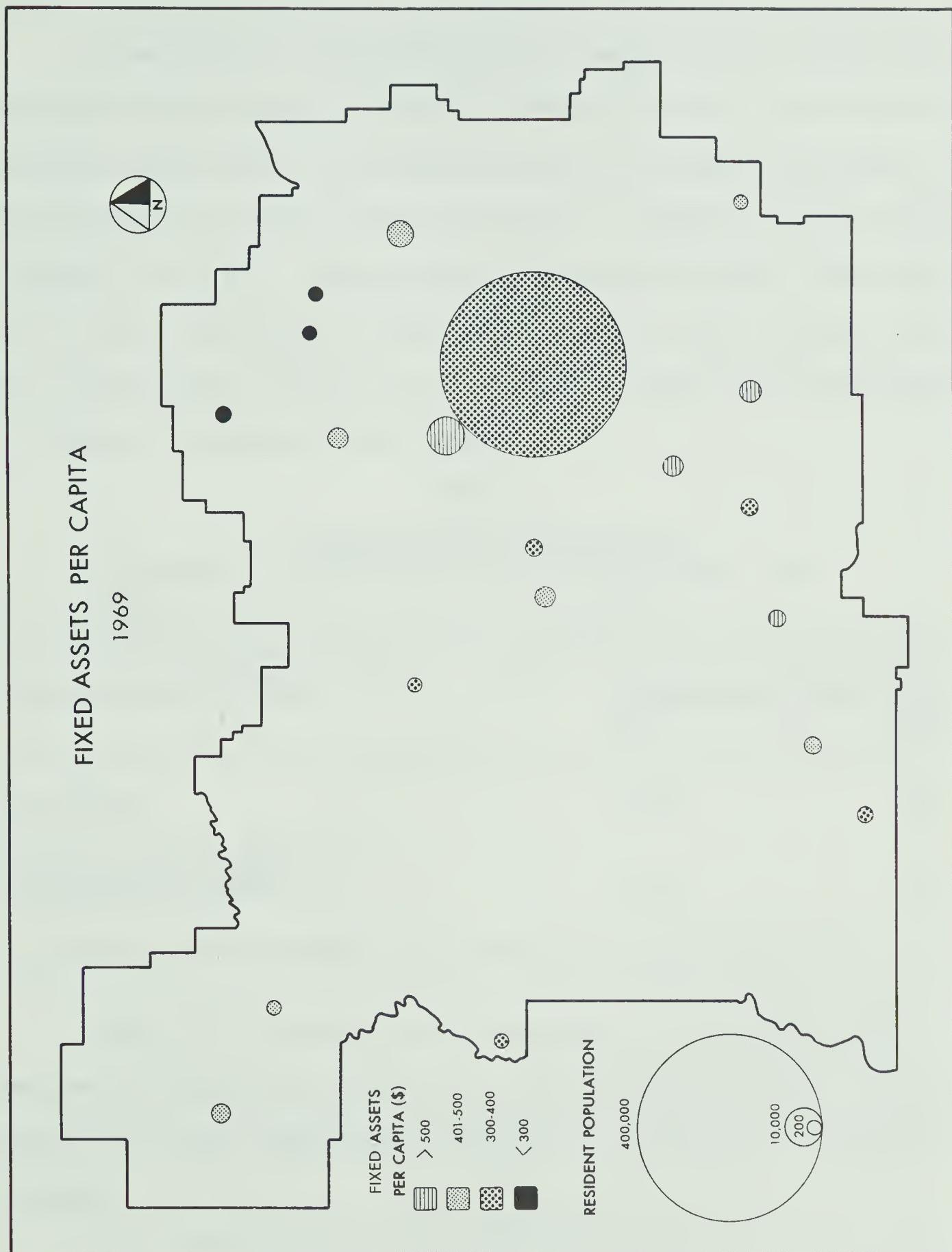


Figure 3.7

values exist for both indices when analyzed by the individual municipalities.

A comparison of the property tax per capita and the fixed assets per capita indicates that a definite association exists between the two variables (Table 3.9). The municipalities having higher per capita tax rates generally also have increased amounts of capital assets per capita (Figures 3.7 and 3.8. This means that those municipalities which have had to invest more money for such items as public works projects, sewerage and sanitation facilities, and recreation centres are usually faced with higher property taxes per capita.

TABLE 3.9

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND CAPITAL EXPENDITURES, 1969

Capital Expenditure Item	Correlation Coefficients	
	PTC	ETR
Fixed Assets	.606	.483
General Debenture Debt by Municipality's Share	.492	-.115

Figure 3.9 illustrates the wide range in values which exist in the general debenture debt per capita for the municipalities. A second observation is that substantial variations exist within the subregional groupings.

The correlation coefficient between the property tax per capita and the general debenture debt by the municipality's share per capita

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
FIXED ASSETS PER CAPITA

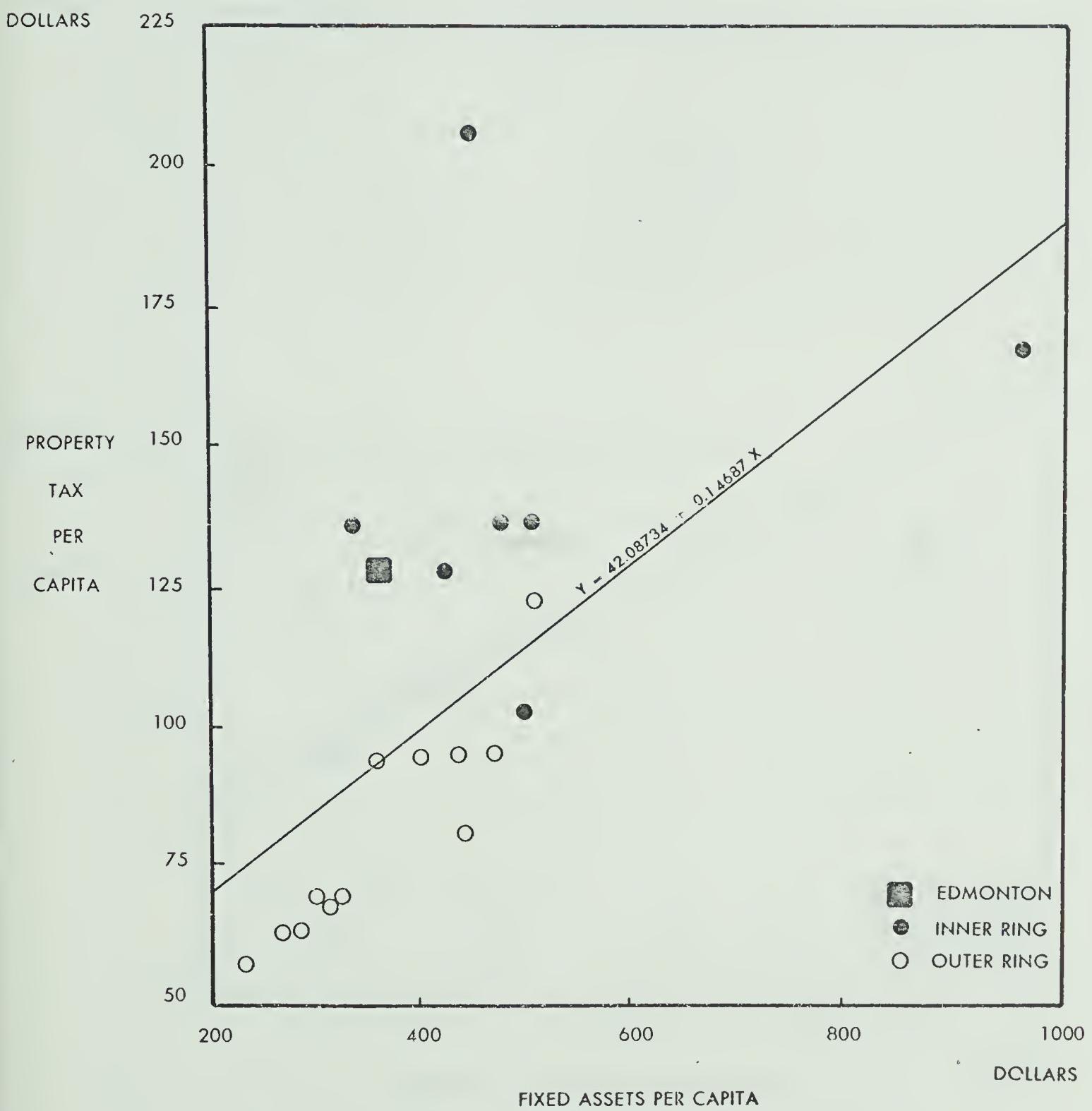


Figure 3.8

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST GENERAL DEBENTURE DEBT PER CAPITA (MUNICIPALITY'S SHARE)

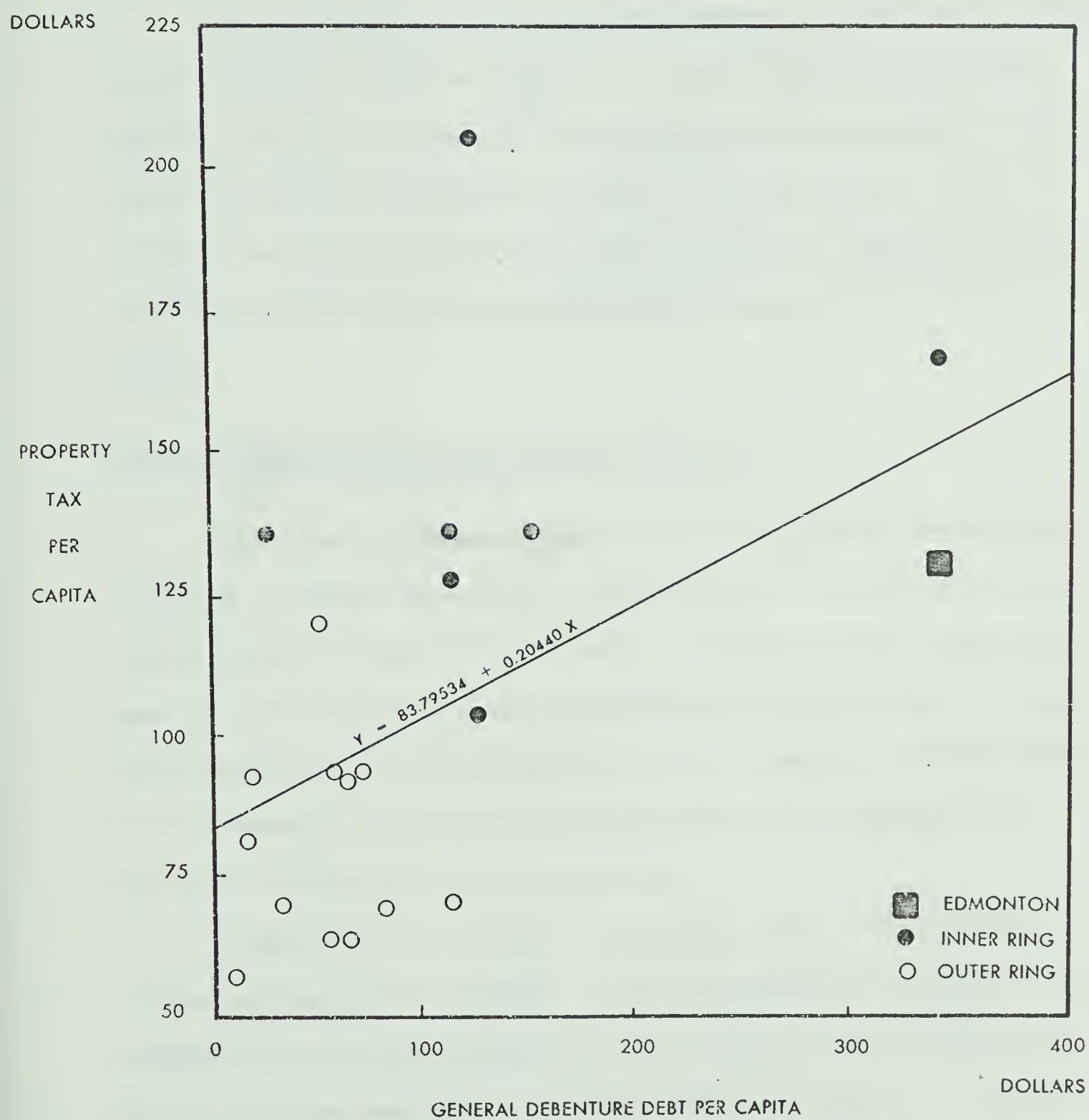


Figure 3.9

($r = .492$) is significant at the five per cent probability level. It may be concluded that those communities faced with increased amounts of property taxes per capita tend also to be characterized by higher debenture debts per capita.

The analysis has shown that the property tax per capita is positively correlated with two indices of capital expenditures--fixed capital assets per capita and the municipal debenture debts per capita. The next section will study the relationship between the effective property tax rate and the fixed capital assets per equalized property tax base and the municipal debenture debt per equalized property tax base.

Capital Expenditures Per Equalized Assessments

The value of capital expenditures per equalized assessments provides a distinct measure of a municipality's ability to meet the costs created by capital investments. A summary of the fixed assets per equalized assessments and the municipal debenture debt per equalized assessments is listed in Table 3.10. A general conclusion from this information is that the average value of both measures has increased considerably over this period.

Figures 3.10, 3.11, and 3.12 indicate that a wide range in values exists for both indices. Little homogeneity in capital expenditures per equalized assessments exists within the three subregions. The correlation analysis between the effective property tax rate and the value of fixed assets per \$1,000 of equalized assessments does indicate that a positive association is present ($r = .492$). This

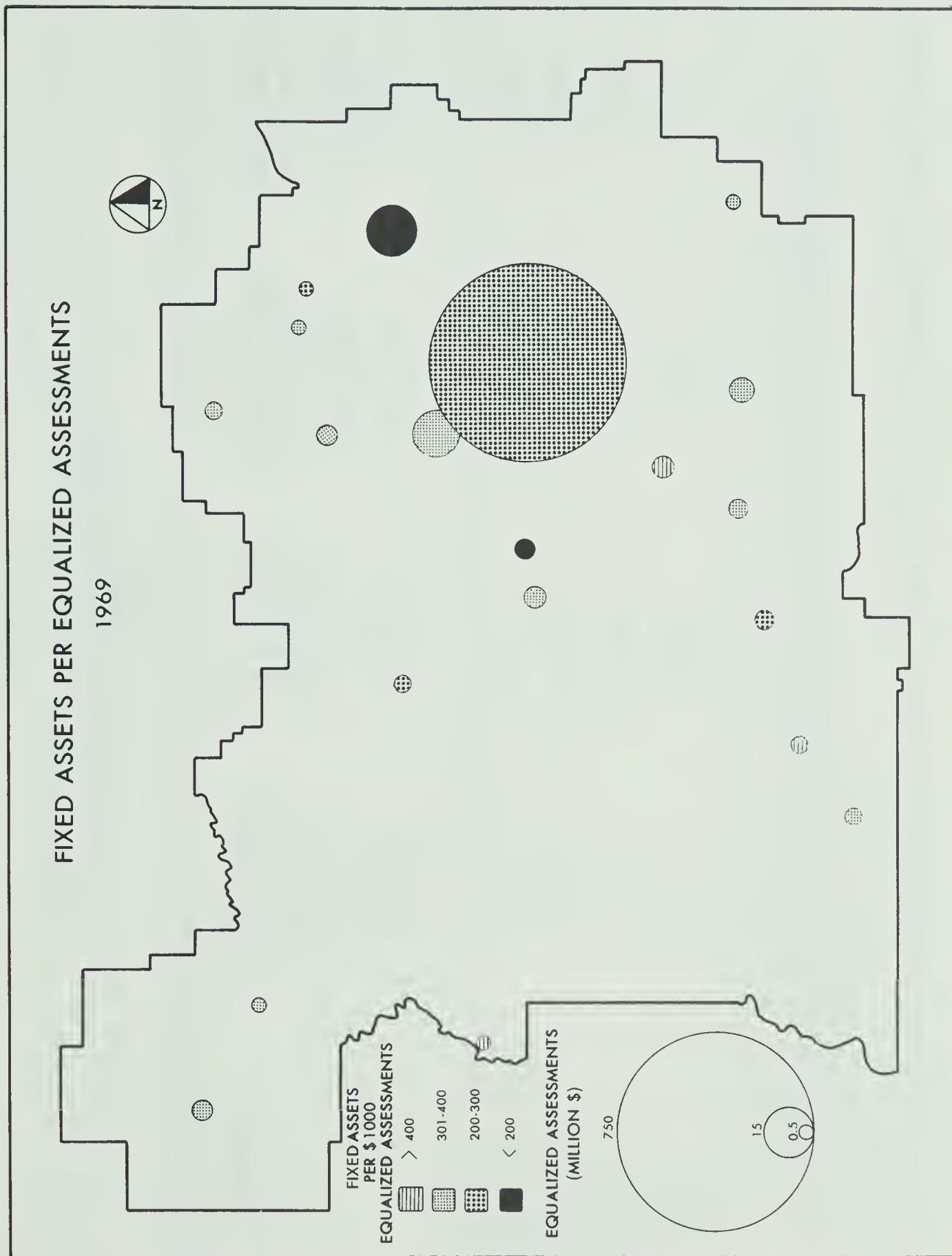


Figure 3.10

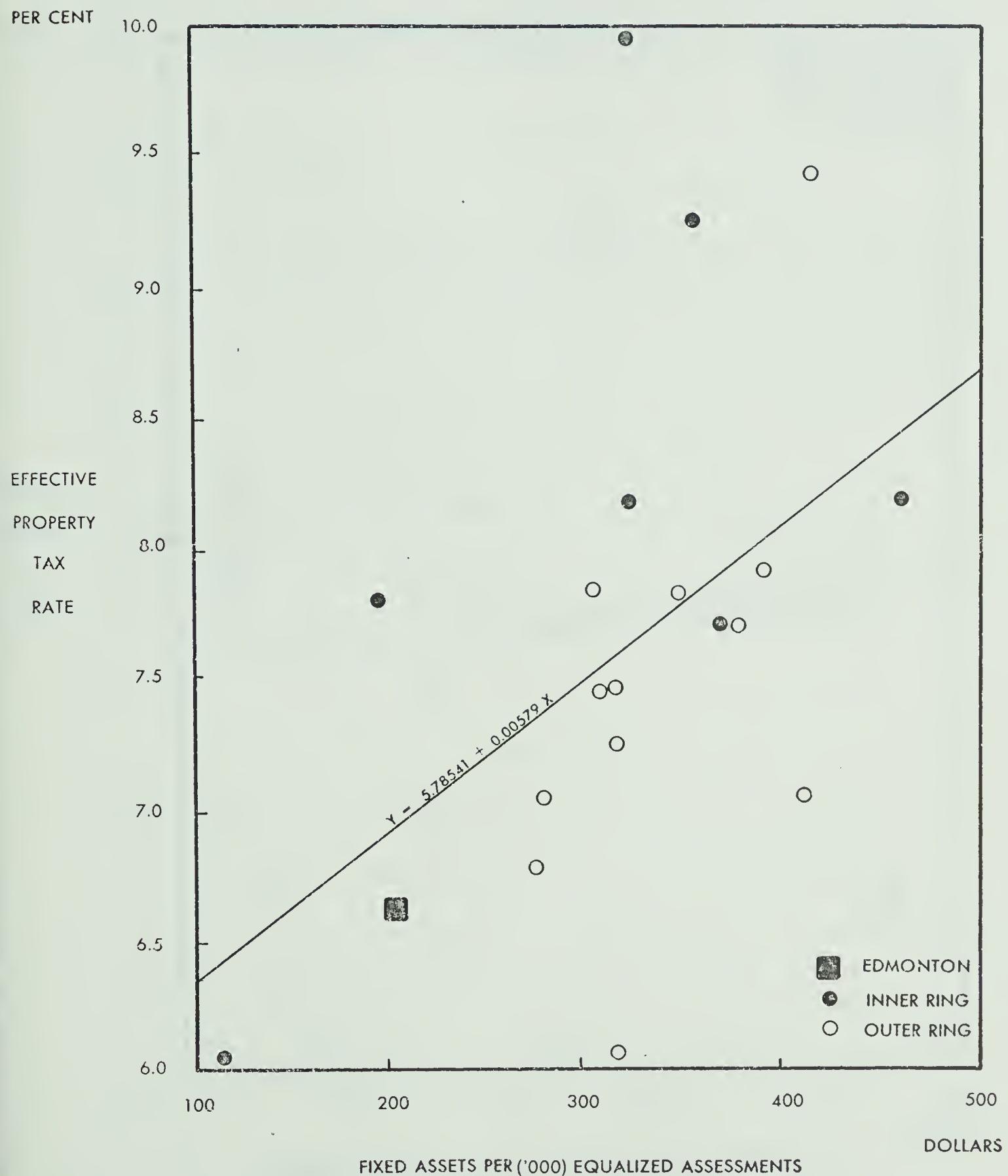
TABLE 3.10

SELECTED INDICES OF THE CAPITAL ACCOUNTS,
PER \$1,000 OF EQUALIZED ASSESSMENTS,
BY SUBREGIONS, 1964 AND 1969

Subregion	Fixed Assets Per \$1,000 of Equalized Assessments	Fixed Assets Per \$1,000 of Equalized Assessments	Municipal Debenture Debt Per \$1,000 of Equalized Assessments	Municipal Debenture Debt Per \$1,000 of Equalized Assessments
	1964 (Dollars)	1969 (Dollars)	1964 (Dollars)	1969 (Dollars)
City of Edmonton	214.43	202.34	116.56	186.34
Inner Ring	266.11	308.53	73.45	83.02
Outer Ring	263.27	342.06	51.79	51.24
Region	261.75	323.34	63.18	72.11

Source: The calculations were made from information published in Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969; and from the Alberta Equalization Board.

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
FIXED ASSETS PER \$1000 EQUALIZED ASSESSMENTS



REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
GENERAL DEBENTURE DEBT PER \$1000 EQUALIZED ASSESSMENTS

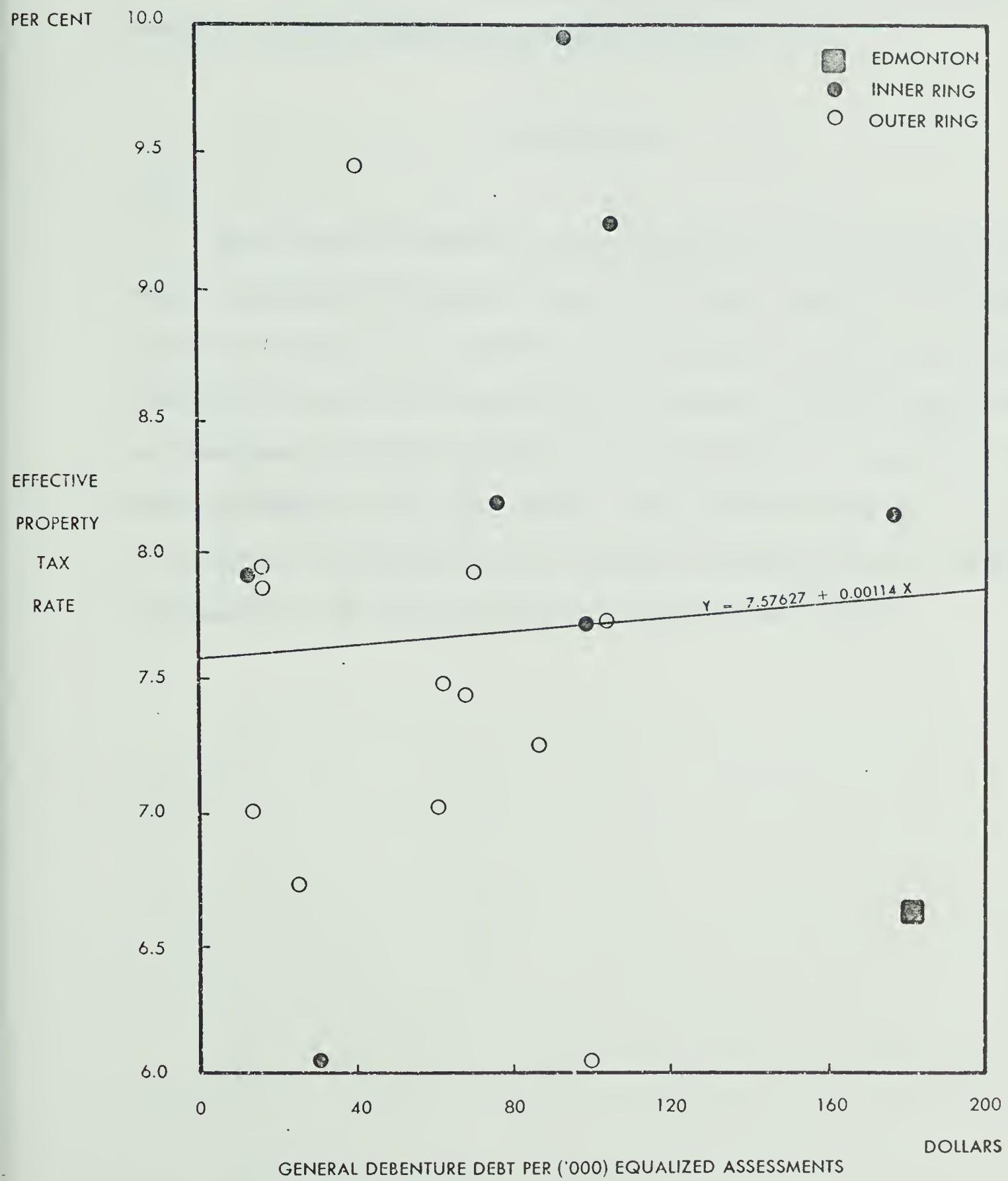


Figure 3.12

pattern is similar to the relationship between the property tax per capita and the fixed assets per capita. Little association is shown between the effective property tax rate and the municipal debenture debt per \$1,000 of equalized assessments (Table 3.9).

CONCLUSION

The analyses conducted in this chapter have shown that the property tax measures are closely linked with various aspects of municipal government finance. The property tax per capita is positively associated with the municipal expenditures per capita, the real property tax as a percentage of total revenues, the fixed assets per capita, and the municipal debenture debts per capita. The effective property tax rate is positively associated with the municipal expenditures per equalized assessments and the fixed assets per equalized assessments.

Chapter IV

DETERMINANTS OF PROPERTY TAX LEVELS: POPULATION INDICES

The main purpose of this chapter is to study the relationship between property tax levels and various community population characteristics. The composition of a municipality's population is a significant factor in determining local revenue requirements. Since the real property tax is the main source of revenue available to finance municipal operations, a study of population characteristics should be useful for analyzing property tax levels. Three main indices will be examined: population growth, age distributions and population densities.

POPULATION GROWTH

Detailed information of past populations, current populations and estimates of future populations provide an important basis for assessing local financial requirements. Rapid population growth forces local municipalities to finance extensive capital investment projects including improved transportation networks, new sanitation and sewerage plants, and increased educational and recreational facilities.

Population growth also necessitates large amounts of current expenditures.¹ Increased expenditures stem from more extensive police

¹See for example in the Appendix, Table 9.

and fire protection, public health services, social assistance programs, and related municipal undertakings. It is anticipated that the municipalities characterized by rapid growth rates will generally display increased levels of property taxation, at least for certain components of the property tax.

Population Growth--1960-1970

A summary of the population growth experienced by the three sub-regions during 1960-1970 is given in Table 4.1. The population for all the urban municipalities within the study area rose from 286,967 in 1960 to 453,470 in 1970, an increase of 58.03 per cent. By comparison, the total population residing in Alberta's urban municipalities rose from 849,314 in 1960 to 1,183,955 in 1970, an increase of 39.40 per cent.²

The City of Edmonton has the greatest absolute population (Figure 4.1). The highest growth rate was experienced by the inner ring municipalities with an average rate of increase of 82.85 per cent. The City of Edmonton had a population increase of 56.84 per cent. The mean increase for the outer ring municipalities was 49.90 per cent, a rate which is not very much lower than that of the City of Edmonton.

Projected Population Growth--1970-1980

The population for each municipality in 1975 and 1980 may be projected by using the formula:

$$\frac{P_4 = P_3 + 3P_3 - 2P_2 - P_1}{4}$$

²Population figures as established under The Municipalities Assistance Act in Alberta, The Department of Municipal Affairs, Annual Report, 1960 and 1965, and The Alberta Municipal Counsellor, Vol. 15 No. 3, April-May, 1970.

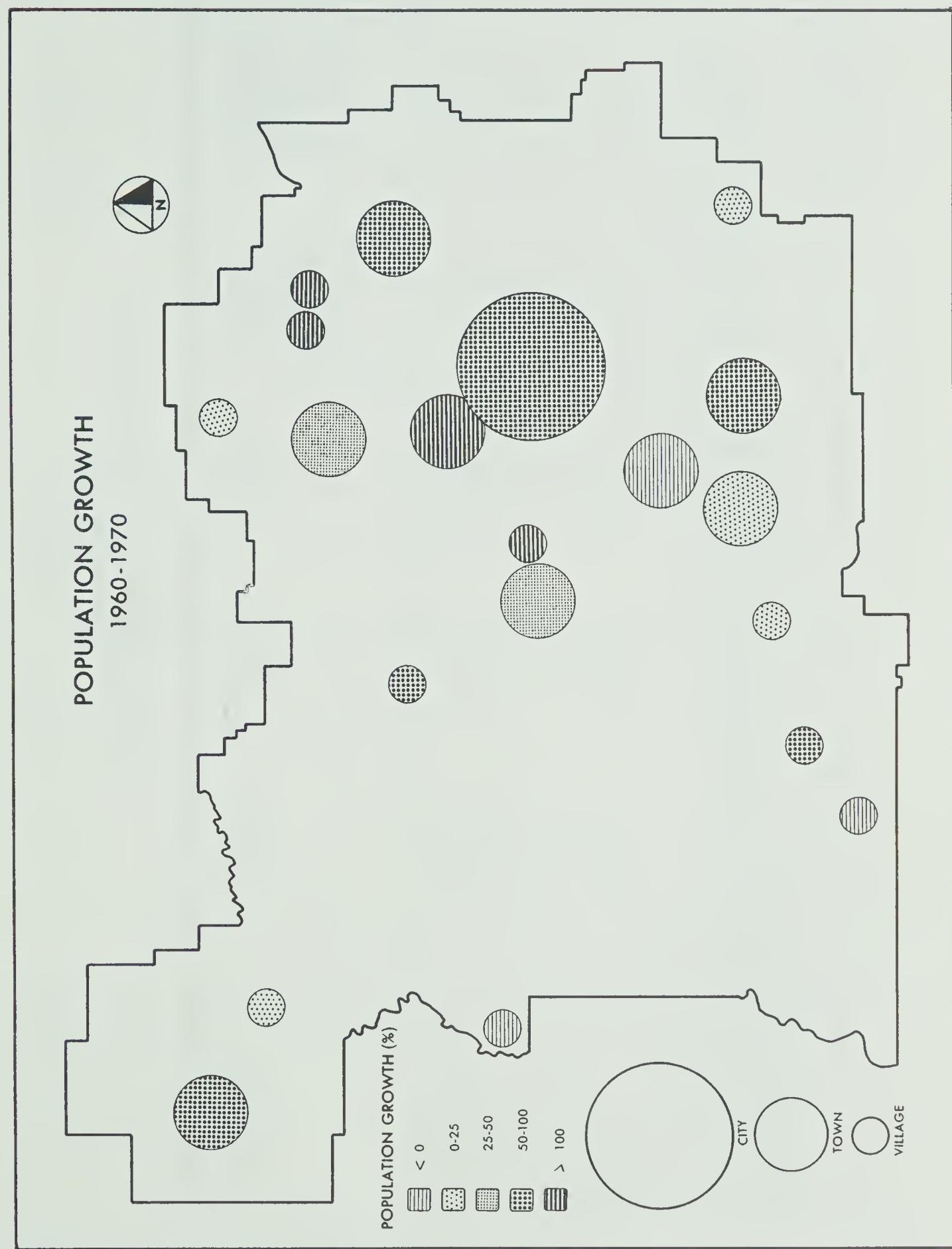


Figure 4.1

TABLE 4.1
POPULATION GROWTH
BY SUBREGIONS, 1960, 1965, AND 1970

Subregion	Population 1960	Population 1965	Population 1970	Total Population Growth 1960-1970 (per cent)	Average Population Growth 1960-1970 (per cent)
City of Edmonton	269,314	357,696	422,418	56.84	56.84
Inner Ring	13,026	20,233	24,998	91.90	82.85
Outer Ring	4,627	5,570	6,054	30.84	49.90
Region	286,967	383,499	453,470	58.84	61.78

Source: Population figures as established under The Municipalities Assistance Act in Alberta, The Department of Municipal Affairs, Annual Report, 1960 and 1965, and The Alberta Municipal Counsellor, Vol. 15, No. 3, April-May, 1970.

where: P_4 = 1975 Population
 P_3 = 1970 Population
 P_2 = 1965 Population
 P_1 = 1960 Population³

The anticipated 1980 population for all municipalities is 604,820 (Table 4.2). The subregional trends which were characteristic of the 1960-1970 period are assumed to be maintained for the 1970-1980

TABLE 4.2

PROJECTED POPULATION GROWTH*
BY SUBREGIONS, 1975 AND 1980

Subregion	Projected Population 1975	Projected Population 1980
City of Edmonton	492,918	561,973
Inner Ring	30,373	35,595
Outer Ring	6,655	7,252
Region	529,946	604,820

*Based on the formula listed under footnote 3 of this chapter.

Source: Calculations were made from population figures as established under The Municipalities Assistance Act in Alberta, The Department of Municipal Affairs, Annual Report, 1960 and 1965, and The Alberta Municipal Counsellor, Vol. 15, No. 3, April-May, 1970.

³A similar formula was employed by Alberta, The Department of Municipal Affairs, Provincial Planning Branch, Population I - Trends, Sept., 1967, p. 1.

period. The inner ring municipalities should have the highest growth rates, followed by the City of Edmonton and the outer ring municipalities.

Property Tax Levels and Population Growth

A correlation analysis comparing the 1960-1970 population growth rates with the two indices of property taxation showed that little relationship existed with either tax variable (compare Figures 1.1 and 1.4 with Figure 4.1). The procedure used in this section studies the impact of population growth on two specific components of the property tax--the amounts requisitioned for municipal and supplementary school purposes.

The results of the correlation analyses listed in Table 4.3 shows that the only important relationship exists between the supplementary school requisitions and the 1960-1970 population growth. The municipalities which have experienced the most rapid population growths are characterized by higher effective tax rates for supplementary school purposes. This relationship is also indicated for the property tax per capita and supplementary school requisitions although the association is fairly weak.

The analyses also show that the percentage of population growth is negatively associated with the size of municipal requisitions of either property tax index. Municipalities characterized by rapid population growth are shown to spend a relatively smaller amount of their property tax revenue for municipal requirements. However, the

REGRESSION LINE FOR SUPPLEMENTARY SCHOOL PORTION OF
 EFFECTIVE PROPERTY TAX RATE
 AGAINST POPULATION GROWTH (1960-1970)

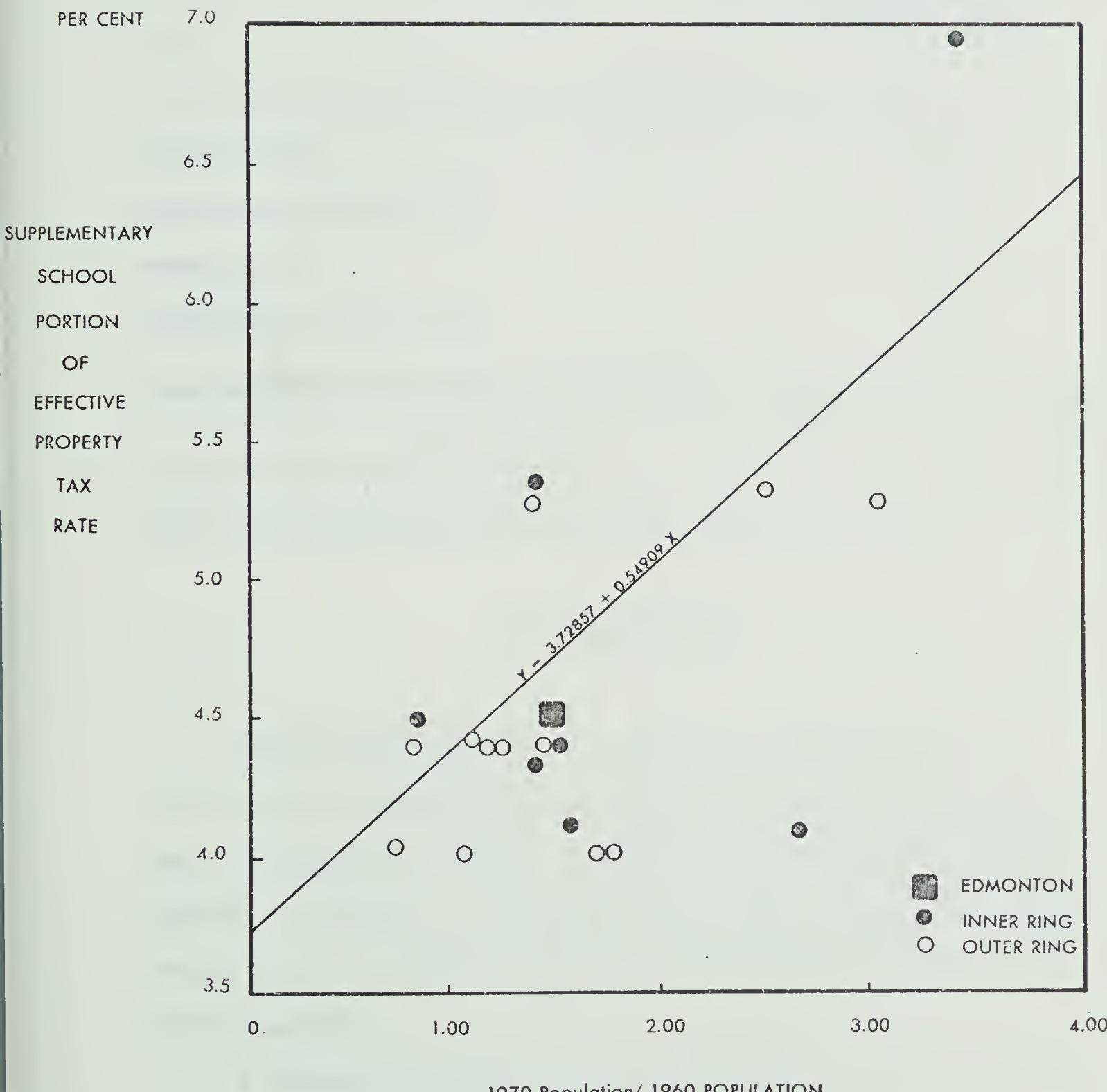


Figure 4.2

TABLE 4.3

COEFFICIENTS OF CORRELATION
 POPULATION GROWTH (1960-1970) AND
 SELECTED COMPONENTS OF THE PROPERTY TAX LEVELS

Tax Component	Coefficients of Correlation
Population Growth 1960 - 1970	
Municipal PTC	-.199
Supplementary School PTC	.305
Municipal ETR	-.285
Supplementary School ETR	.536

low correlation coefficients (PTC $-r = -.199$; ETR $-r = -.285$) indicate that these relationships are of little explanatory value.

AGE DISTRIBUTIONS

The age distribution of a community's population may also influence local expenditures. A high proportion of young people in the population generally results in greater expenditures for educational purposes. Similarly, a disproportionate number of elderly residents usually leads to increased requisitions from public health and social service agencies.

A number of measures can be used to study the age distribution

of a population. Three basic indices were selected for this study. The first division lists the proportion of the population under 15 years of age and corresponds to the minimum school-age as required by legislation passed in Alberta. A second listing consists of the proportion of the population between the ages of fifteen and sixty-five. The final category consists of all residents who are sixty-five years of age or over.

A combined measure of all three indices is defined by D.B.S. as the dependency ratio.⁴ This measure is obtained by combining the population under fifteen years of age and sixty-five years of age or over, and dividing this total by the population between the ages of fifteen and sixty-five.

Table 4.4 provides a summary of the age distributions by the three subregions. The outer ring municipalities have the highest average dependency ratio due essentially to a relatively large proportion of residents who are sixty-five years of age and over (Figure 4.3). One explanation for the high concentration of elderly people is that many of the farmers move to these communities upon reaching retirement age. A second factor is that the younger residents are more likely to migrate to the more urbanized localities.

Figure 4.4 illustrates that the outer ring municipalities display similar proportions of elderly residents in their age distributions. A definite grouping also exists for the remaining municipalities with the

⁴ As defined in the Standard User Data Sets, Population Research Laboratory, University of Alberta, August, 1970.

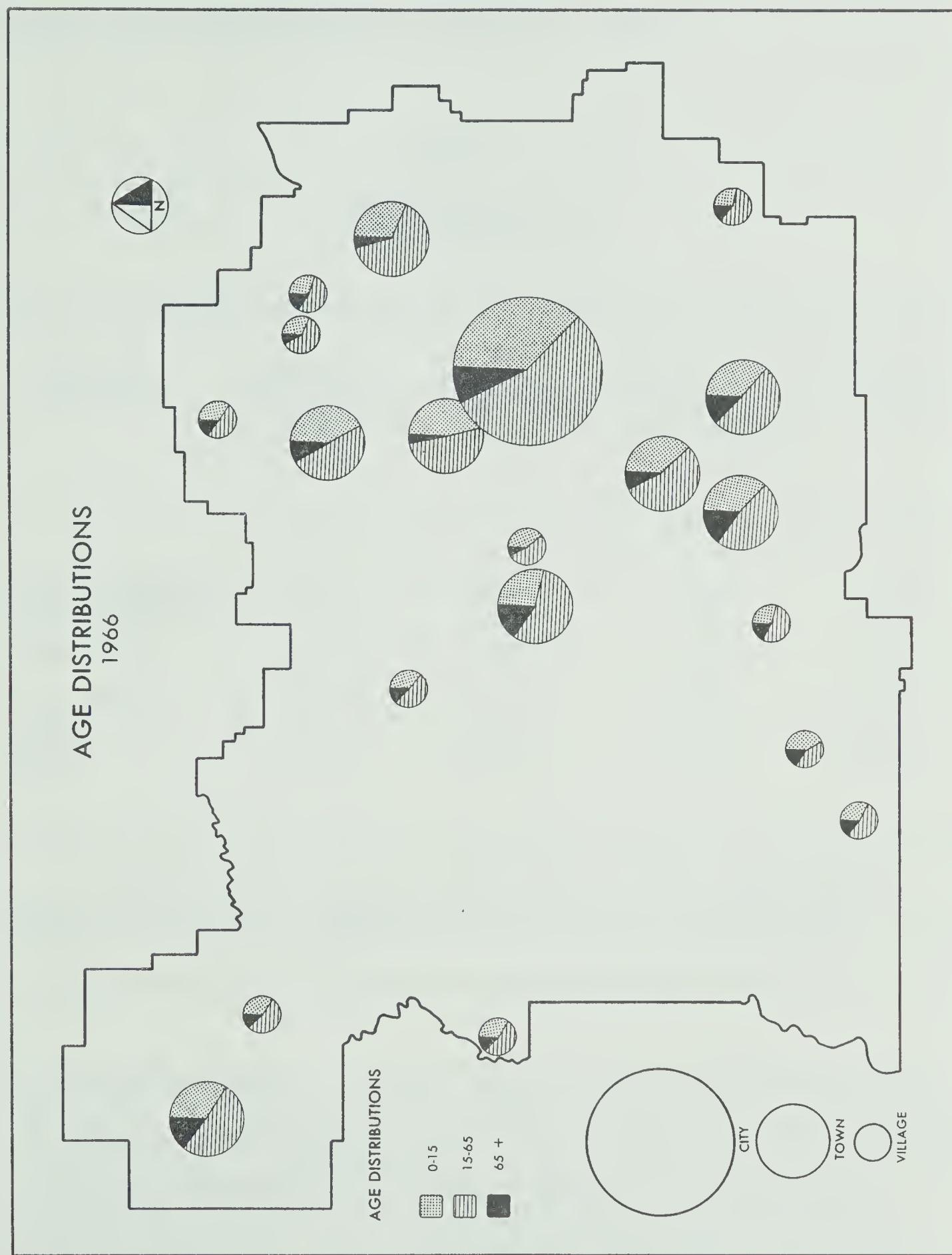


Figure 4.3

proportion of residents sixty-five years of age and over being substantially lower than those of the outer ring subregion.

TABLE 4.4

AGE DISTRIBUTIONS
BY SUBREGIONS, 1966

Subregion	Percentage 0-14 Years Of Age	Percentage 15-65 Years Of Age	Percentage 65 Years Of Age and Over	Dependency Ratio
City of Edmonton	33.74	60.25	6.01	0.660
Inner Ring	35.89	56.54	7.57	0.775
Outer Ring	31.21	53.81	13.27	0.864
Region	33.98	55.11	10.91	0.823

Source: The data were computed from: Canada, The Dominion Bureau of Statistics, Enumeration Area Data Print-Out Statements, 1966.

A substantial amount of variation exists in the age distributions for the inner ring municipalities which tends to distort the reliability of the average subregional rates listed in Table 4.4 (see for example Figures 4.3 and 4.5). The next section will study the relationship between property tax levels and age distributions.

Property Tax Levels and Age Distributions

Municipalities having relatively small dependency ratios are expected to be faced with smaller requisitions for such items as educational facilities, recreation needs, and senior citizen accommodation. It seems likely that low dependency ratios will be accompanied by lower levels of property taxes.⁵

A comparison of the age distributions and the property tax per capita is listed in Table 4.5. There is a positive relationship between the property tax per capita and the proportion of the population between the ages of fifteen and sixty-five ($r = .519$). Conversely, a negative association exists between the property tax per capita and the dependent populations, as measured by the proportion aged sixty-five years and over ($r = -.582$) and the dependency ratio ($r = -.498$).

High amounts of property taxes per capita are associated with the municipalities having smaller proportions of dependent populations. This finding contradicts the initial hypothesis that low dependency ratios will be accompanied by lower levels of property taxes. The main factor responsible for this development is the Albertan system of revenue-sharing programs in the form of school and hospital equalization.

⁵For a discussion of the effects of high proportions of dependent populations on the property tax rate see: D. J. Curran, "Inframetropolitan Competition", Land Economics, Volume XL, No. 1, Feb. 1964, pp. 95-99; R. Spangler, "The Effect of Population Growth Upon State and Local Government Expenditures", National Tax Journal, Volume 16, 1963, pp. 192-196; L. A. Stiles, "Financing Government in the Suburbs--The Role of the Property Tax", National Tax Association, Proceedings of the 53^d Annual Conference, 1960, pp. 52-53.

TABLE 4.5
COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND
THE POPULATION BY AGE-DISTRIBUTIONS

Age Groupings by Percentages	Coefficients of Correlation	
	PTC	ETR
0 - 14 years	.066	.456
15 - 65 years	.519	-.326
65+ years	-.582	-.149
Dependency Ratio	-.498	.276

The 1969 provincial tax levy collected payments from property assessments of 28 mills for the School Foundation Program, and a 4 mill rate for the Hospital Benefits Program, based on the equalized assessment. The result is that the municipalities having high amounts of equalized assessments are required to contribute a larger share towards these provincial programs.

A comparison between the effective property tax rate and the age distribution indicates the opposite result than is obtained for the property tax per capita and the age distributions. A positive association is found between the effective tax rate and the proportion of the population under fifteen years of age ($r = .456$). This indicates that increased proportions of this age group results in higher effective tax

rates. A similar pattern is also shown between the effective tax rate and the dependency ratio, although the association is relatively low ($r = .276$). The initial hypothesis that low dependency ratios will be accompanied by lower levels of property taxes is verified when the effective property tax rate is used in the correlation analysis.

1) Supplementary School Tax and Age Distributions. The previous sections illustrated that a negative association existed between the property tax per capita and the proportion of the population classified as dependent. A comparison between the effective tax rate and the dependent population showed a positive correlation. The purpose of this section is to compare one particular component of the property tax levels, the supplementary school portion, with selected age groupings.

Figure 4.4 illustrates the relationship between the supplementary school tax per capita and the proportion of the population sixty-five years of age and over. A fairly significant association is shown for these two variables with increased proportions of the population in this age grouping accompanied by lower supplementary school taxes per capita. A second item shown in Figure 4.4 is that a distinct sub-regional grouping exists for this particular age distribution.

The supplementary school portion of the effective tax rate is compared with the proportion of the population under fifteen years of age. The municipalities characterized by higher proportions of this particular age category are generally characterized by higher supplementary school tax rates.

REGRESSION LINE FOR SUPPLEMENTARY SCHOOL PORTION OF
 PROPERTY TAX PER CAPITA
 AGAINST AGE DISTRIBUTION (SIXTY-FIVE AND OVER)

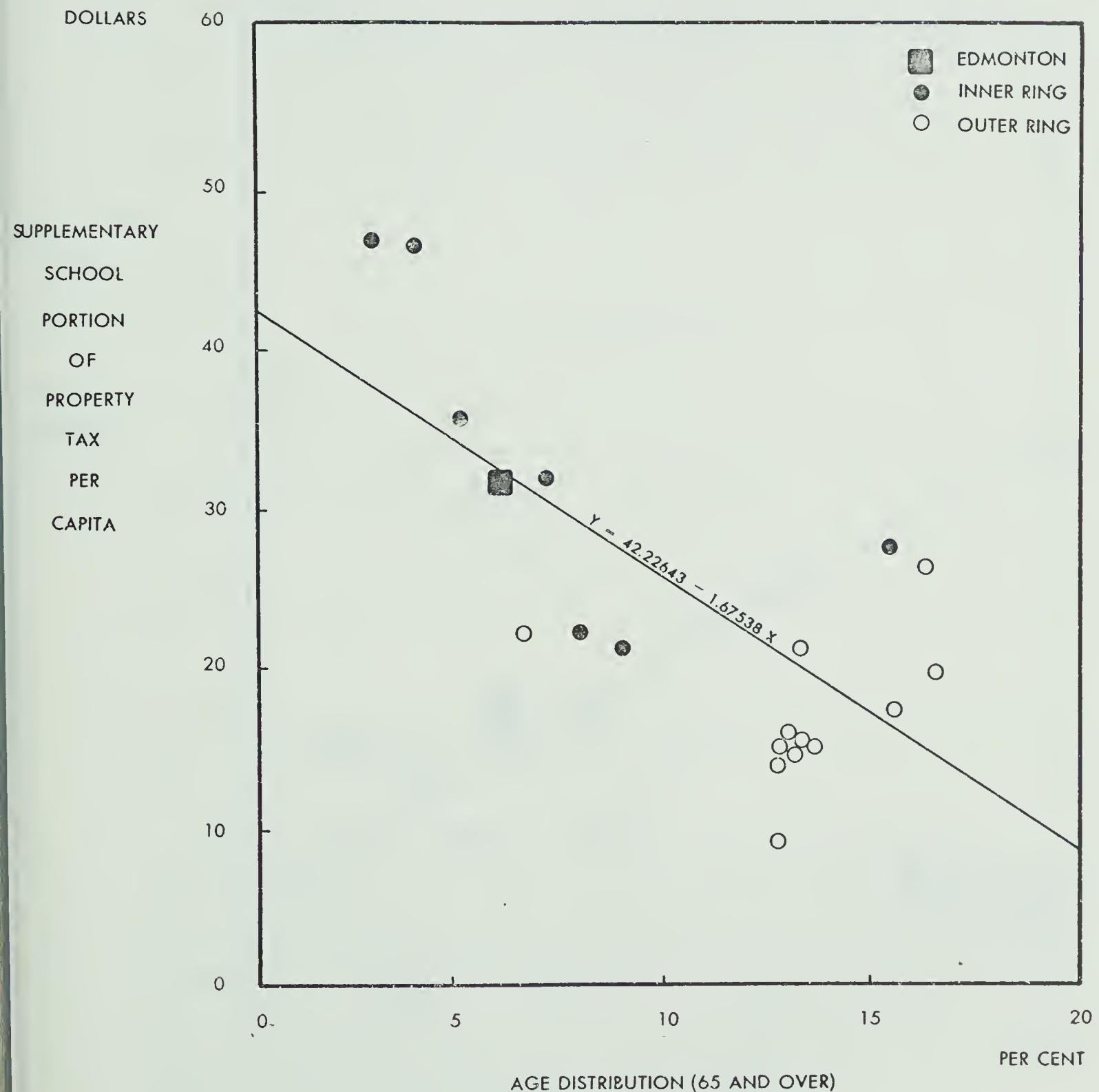


Figure 4.4

REGRESSION LINE FOR SUPPLEMENTARY SCHOOL PORTION OF
 EFFECTIVE PROPERTY TAX RATE
 AGAINST AGE DISTRIBUTION (UNDER FIFTEEN)

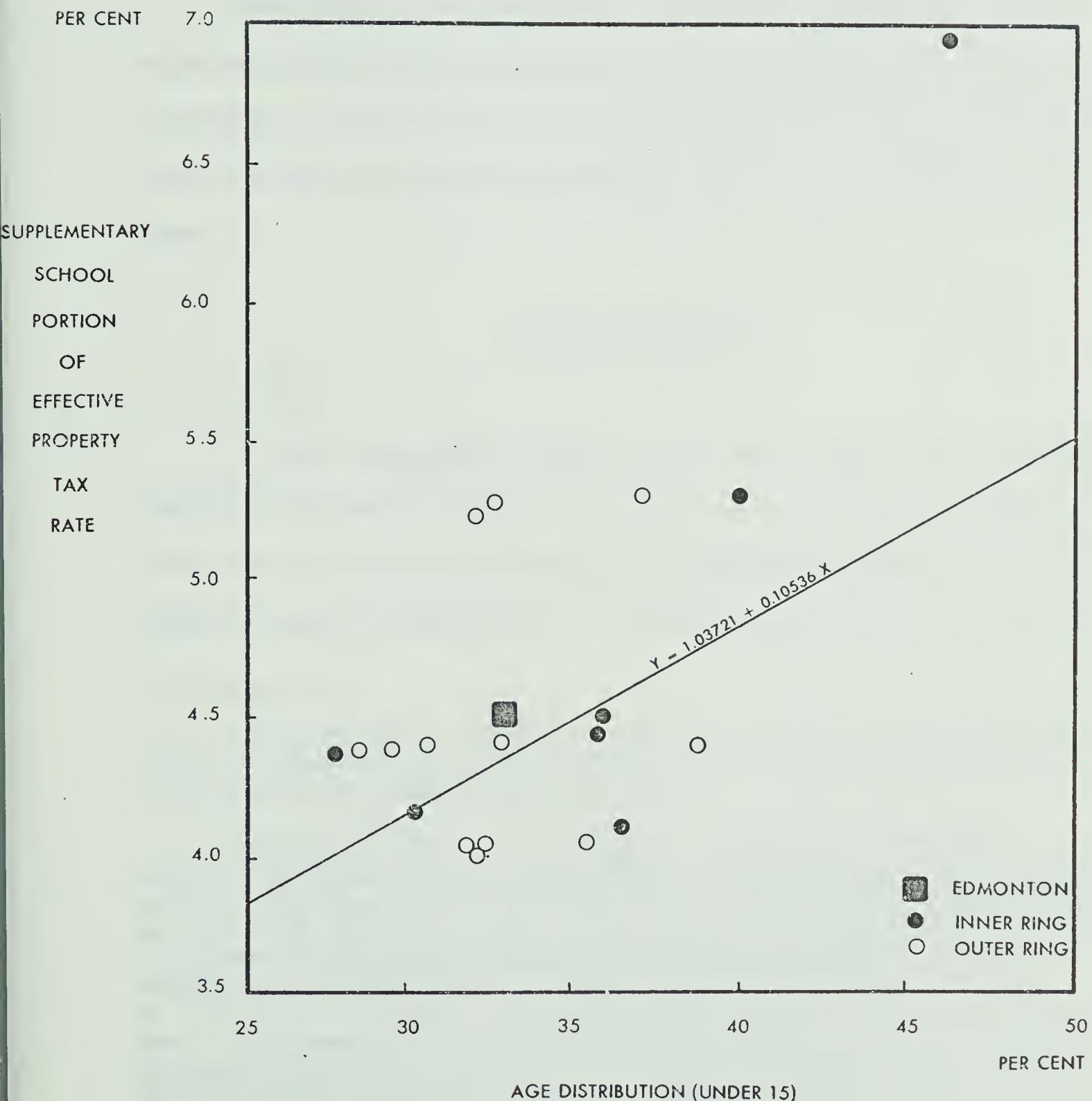


Figure 4.5

The results obtained in this subsection are important for two reasons. The supplementary school tax levies depend almost entirely on the need for additional educational facilities required by the individual municipalities.⁶ These amounts are in addition to the funds supplied through the School Foundation Program.

The second reason why these results are important is that the relationships are more clearly illustrated than when the gross property tax indices are used in the comparisons. The next section will examine the influence of population densities on the levels of property taxation.

POPULATION DENSITY

A final demographic measure used in this study is the population density of the municipalities. A review of the literature indicates that increased population densities are generally accompanied by higher levels of public expenditures.⁷ This condition is usually encountered

⁶ It must also be remembered that the actual number of students within a municipality's school system also includes the students who commute from the surrounding rural areas.

⁷ See for example: A. P. Becker, "Property Tax Problems Confronting State and Local Governments", State and Local Tax Problems, ed. H. L. Johnson, Knoxville, The University of Tennessee Press, 1969, pp. 34-47; M. R. Bloom, "What a State Can Do To Improve the Tax Climate in Downtown", How To Win Downtown Property Tax Relief, ed. L. A. Alexander, New York, National Retail Merchants Association, 1965, pp. 14-17; J. L. Fisher, "Downtown Taxes", op. cit., pp. 36-38; Woo Sik Kee, "City-Suburban Differentials in Local Government Fiscal Effort", National Tax Journal, Volume No. 21, 1968, pp. 183-189; J. E. O'Bannon, "Payments from Tax-Exempt Property", Property Taxation--U.S.A., ed. R. W. Lindholm, Madison, 1967, pp. 187-212.

in the older urban areas where the deteriorated physical plant requires extensive investments in such items as urban renewal projects and more efficient modes of transportation. These districts are also characterized by higher social service costs, financed in part by local revenues. A final problem is one of declining tax revenues as a result of lower assessments and increasing numbers of tax-exempt properties.

Communities having low population densities may also be characterized by high levels of municipal expenditures resulting in increased property tax levies. One example of this is urban sprawl which is characterized by low densities, fragmented land-use patterns, a high percentage of vacant land, and generally poor development standards.⁸ These fragmented built-up areas must be serviced with roads, utility lines and other municipal services.

Population Per Residential Area

The index of population density used in this study is the population per residential area.⁹ The distributions illustrated in Figures 4.7 and 4.8 show that the City of Edmonton has the highest

⁸ See for example: R. B. Andrews, J. J. Dasso, "The Influence of Annexation of Property Tax Burdens", The National Tax Journal, Volume No. 14, March 1961, pp. 88-98; R. Barlowe, "Taxation of Agriculture", ed. R. W. Lindholm, op. cit., especially pp. 93-97; L. A. Stiles, "Some Possibilities for Meeting Property Tax Problems Arising from Multiplicity of Governmental Units", The Property Tax-Problems and Potentials, The Tax Institute of America, Princeton, 1967, pp. 418-422.

⁹ The density is obtained by comparing the 1969 resident population with the municipality's total residential land-use based on 1969-1970 surveys.

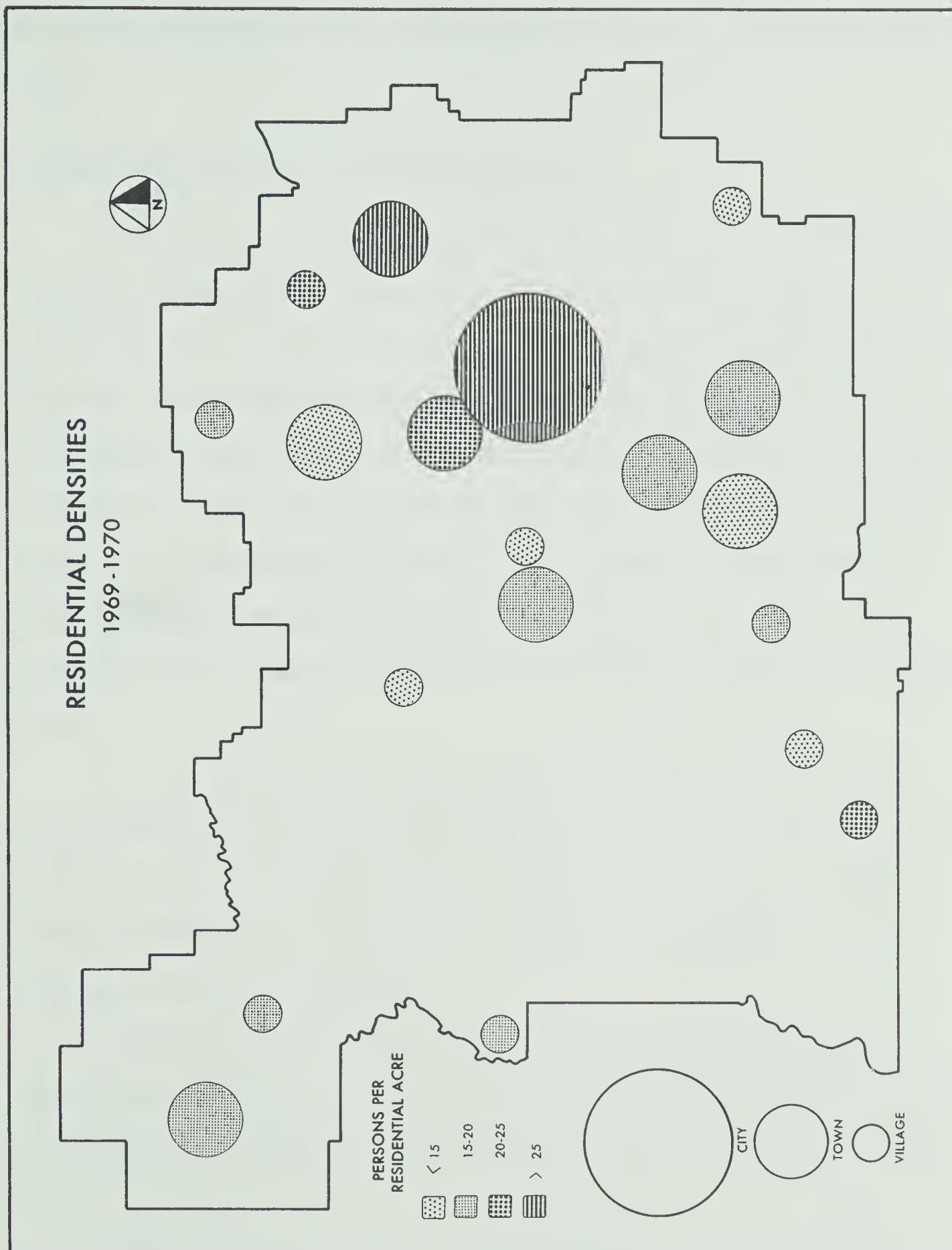


Figure 4.6

population density per residential area.¹⁰ The remaining two subregions are both characterized by a wide range in population densities (Figure 4.6).

Property Tax Levels and Population Densities

A comparison between the property tax per capita and the population per residential area shows a positive association although the correlation is quite low ($r = .352$). The estimating equation shown in Figure 4.7 indicates that most of the inner ring municipalities are located above the regression line while most of the outer ring municipalities fall below the regression line. Therefore, estimates of the property tax per capita for the inner ring municipalities based on their population density would be too low whereas estimates of the property tax per capita for the outer ring municipalities would be too high.

It may be concluded that distinct subregional relationships exist between the property tax per capita and population density. A general conclusion for the entire region is that increased property taxes per capita are characteristic of those municipalities having increased population densities.

Figure 4.8 illustrates that a negative association exists between the effective tax rate and the population per residential area. One explanation for this negative relationship is that the more urban-

¹⁰This figure is expected to be substantially higher in 1969 but the latest available land-use classification for the City of Edmonton was from 1961.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
POPULATION PER RESIDENTIAL AREA

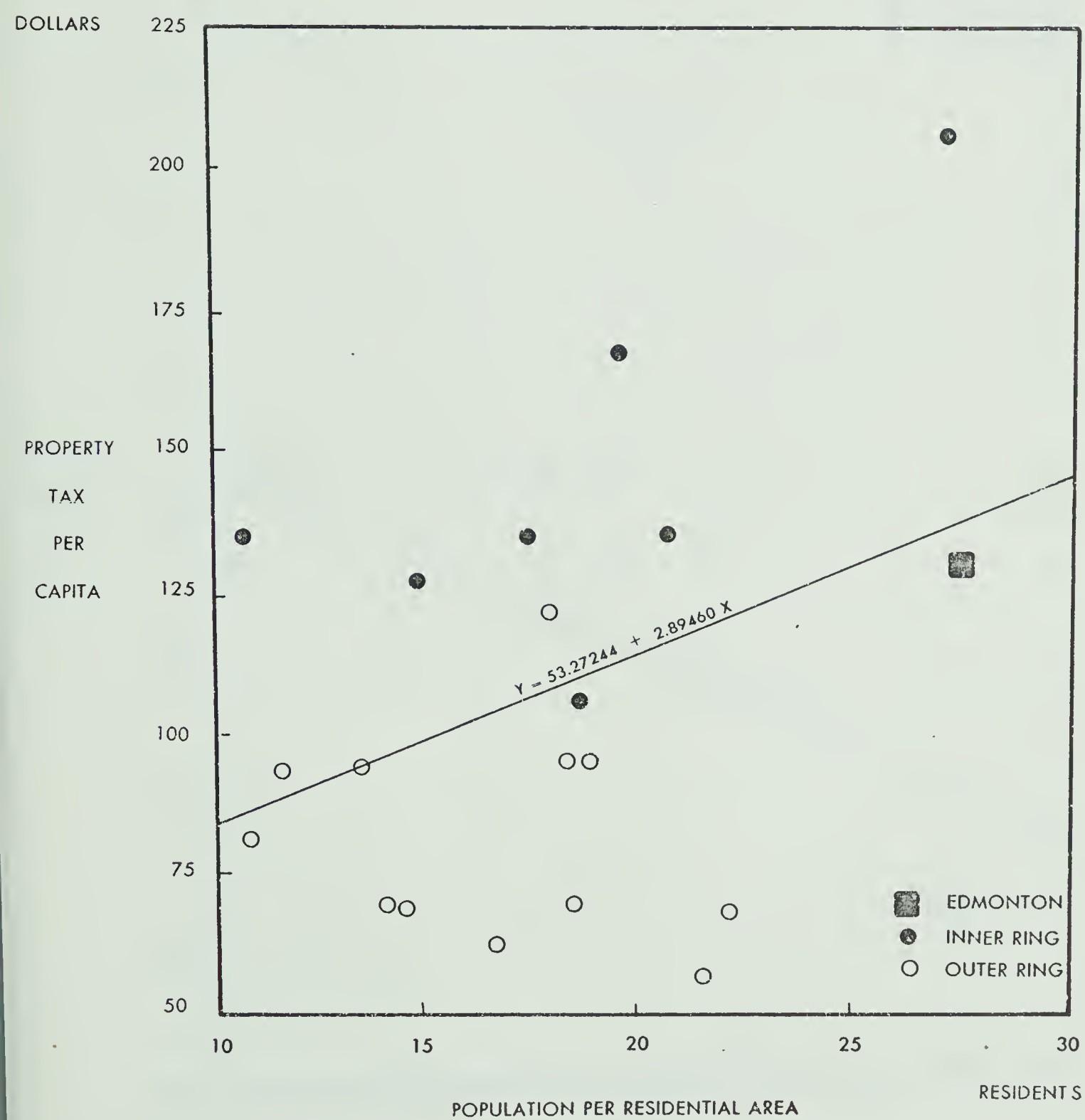


Figure 4.7

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
POPULATION PER RESIDENTIAL AREA

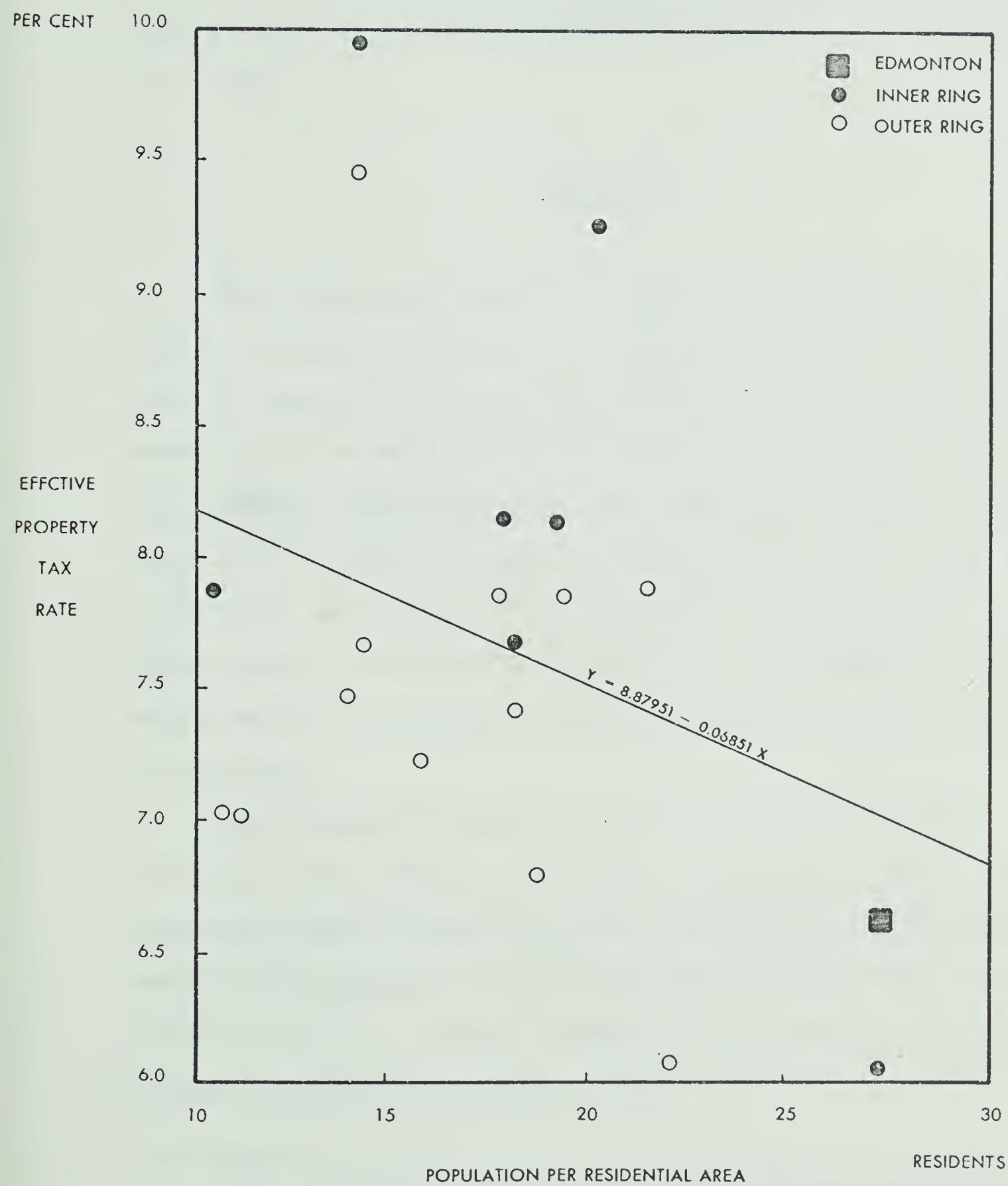


Figure 4.8

ized municipalities are usually characterized by higher property assessments per capita which tend to reduce the effective tax rate.¹¹ Once again it is difficult to draw any firm conclusions from the analysis since a fairly low correlation is indicated between the two variables ($r = -.331$).

CONCLUSION

This chapter has studied the relationships between various population characteristics and the property tax indices. It was shown that the property tax per capita was positively associated with the proportion of the population between fifteen and sixty-five years of age. Negative relationships were found between the property tax per capita and the +65 age grouping, and the dependency ratio. These relationships were better illustrated by using the supplementary school portion of the property tax per capita in the analysis. Population density also displayed a positive association with the property tax per capita.

The effective tax rate was also characterized by positive correlations when compared with a number of population indices. These included the 1960-1970 population growth and the 0-14 age distribution, with both being compared with the supplementary school portion of the effective tax rate. A negative relationship was indicated between the effective tax rate and population density.

¹¹See for example Chapter I, Relationship Between the PTC and the RSR, Figure 1.7.

Chapter V

DETERMINANTS OF PROPERTY TAX LEVELS: SOCIO-ECONOMIC INDICES

A number of studies dealing with property taxation in an urban setting have utilized socio-economic indices in the analysis.¹ One finding was that the high-class residential suburbs were characterized by increased levels of taxation.² Commercial and industrial growth was restricted through the use of a series of zoning covenants and development control regulations. The lack of commercial and industrial property assessments has meant that the property tax would have to be raised almost entirely from residential properties. In effect, these communities were exercising a form of economic segregation since the high levels of property taxation, coupled with inflated land costs, meant that only a certain population stratum could afford to reside in these localities.

The three traditional socio-economic variables commonly used are the levels of income, education, and types of occupation.³ A

¹See for example: A. K. Campbell and S. Sacks, Metropolitan America--Fiscal Patterns and Governmental Systems, New York, The Free Press of Glencoe, 1967, pp. 53-55, 85-95; O. P. Williams *et al.*, Suburban Differences and Metropolitan Policies, Philadelphia, University of Pennsylvania Press, 1965, pp. 163-187.

²See for example: R. G. Townsend, "Inequalities of Residential Property Taxation in Metropolitan Boston", The National Tax Journal, Volume No. 4, 1951, pp. 371-377.

³See for example: A. P. Garbin, F. L. Bates, "Occupational Prestige: An Empirical Study of Its Correlates", Readings in General

fourth measure, social status, is usually assigned on the basis of these three variables. These variables will also form the basic socio-economic indices of this study.⁴

AVERAGE INCOMES

The amount of income a person receives is frequently used to assess socio-economic status. This index may also be interpreted as a general indicator of wealth or affluence. When viewed in this context, it is apparent that a distinct relationship should exist between income levels and the property tax measures.

Table 5.1 provides a summary of the subregional income patterns within the study area. The average male earnings⁵ and the total average income⁶ display similar rates in both the City of Edmonton and the

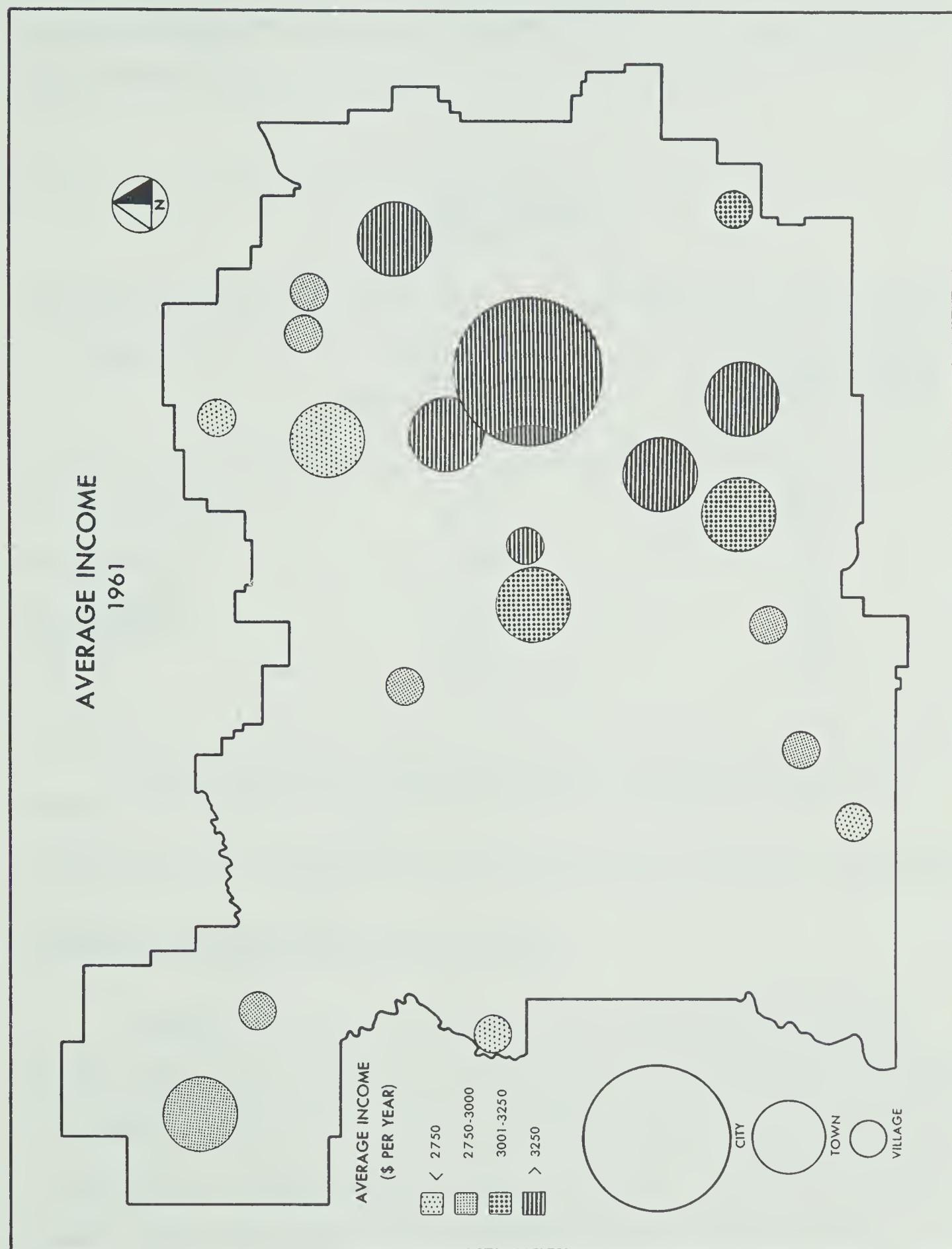
Sociology, ed. R. W. O'Brien et al., Boston, Houghton Mifflin Company, 1964, pp. 43-49; J. Porter, The Vertical Mosaic, An Analysis of Social Class and Power in Canada, Toronto, University of Toronto Press, 1965, pp. 3-28.

⁴ The main drawback is that the latest available data are based on the 1961 DBS census and the results have become dated. Nevertheless, meaningful results are still obtained by using these statistics in the final analysis.

⁵ Classified as "Wage-Earners by Earnings", in Canada, Dominion Bureau of Statistics, Census Bulletin 3.3-2, 1961.

⁶ "Average income is obtained by dividing the aggregate earnings for wage-earners in the area concerned by the number of wage-earners with stated earnings in the area. It should be noted that average income reflects the dependency of earnings on the number of weeks of employment and the number of hours usually worked, especially in the case of female wage-earners, since a greater proportion of females than males are engaged in part-time employment." Canada, Dominion Bureau of Statistics, Census Bulletin 3.3-2, 1961.

Figure 5.1



inner ring municipalities. The average male earnings and the total average incomes are substantially lower in the outer ring municipalities (Figure 5.1).

TABLE 5.1

AVERAGE INCOMES
BY SUBREGIONS, 1961

Subregion	Average Male Earnings (Dollars Per Annum)	Average Earnings Per Wage-Earner (Dollars Per Annum)
City of Edmonton	4,062	3,402
Inner Ring	3,947	3,422
Outer Ring	3,188	2,821
Region	3,186	2,825

Source: The data were obtained from: Canada, The Dominion Bureau of Statistics, Enumeration Print-Out Statements, 1961.

Property Tax Levels and Income Measures

Figures 5.2 and 5.3 illustrate that a positive relationship exists between the property tax per capita and both measures of income. The municipalities characterized by higher earnings per worker are also accompanied by higher property taxes per capita. In addition, approximately half of the inner ring municipalities have higher average earnings than the City of Edmonton. All of the outer ring municipal-

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
AVERAGE ANNUAL MALE EARNINGS

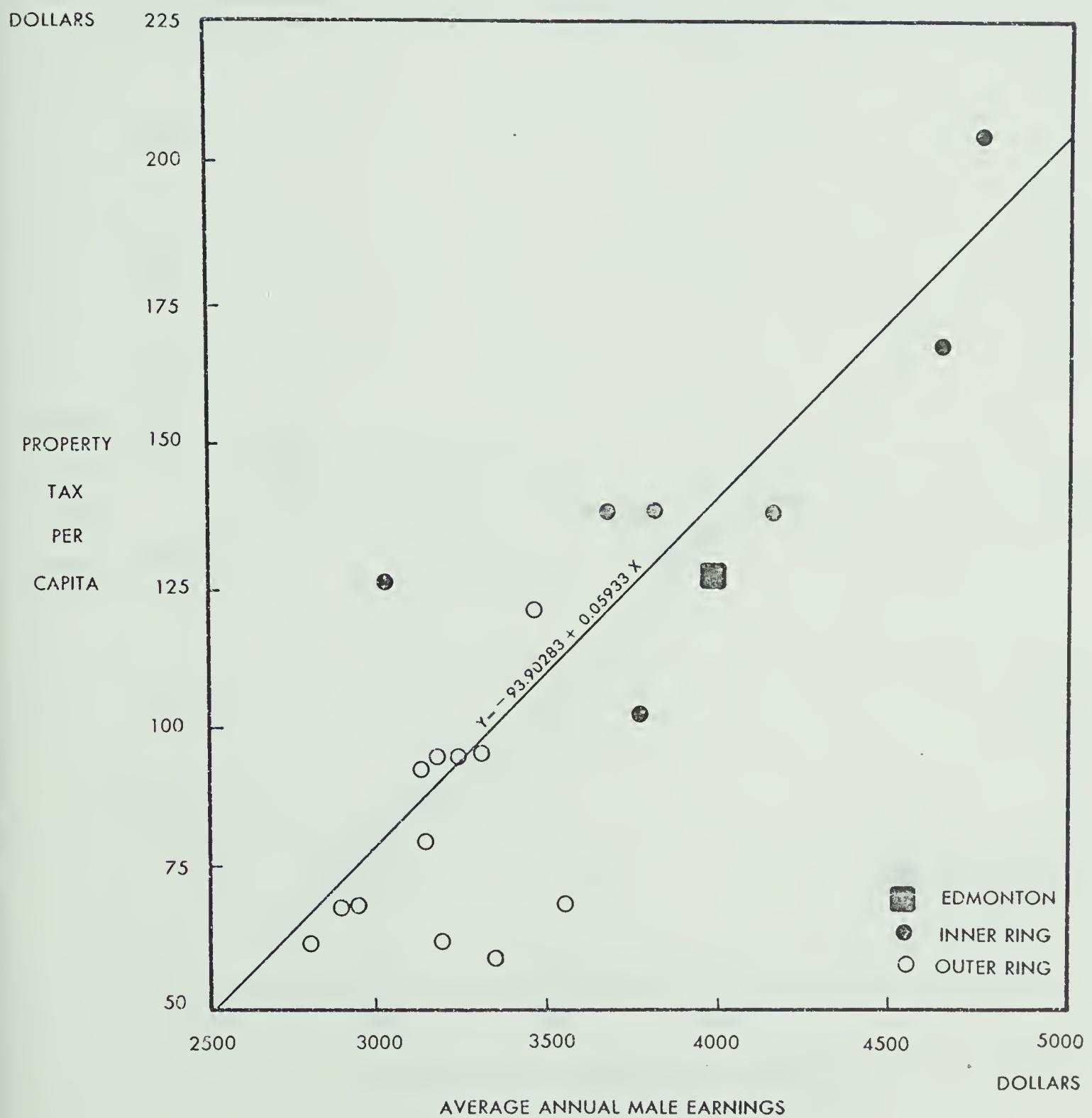


Figure 5.2

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
AVERAGE ANNUAL EARNINGS PER WAGE EARNER

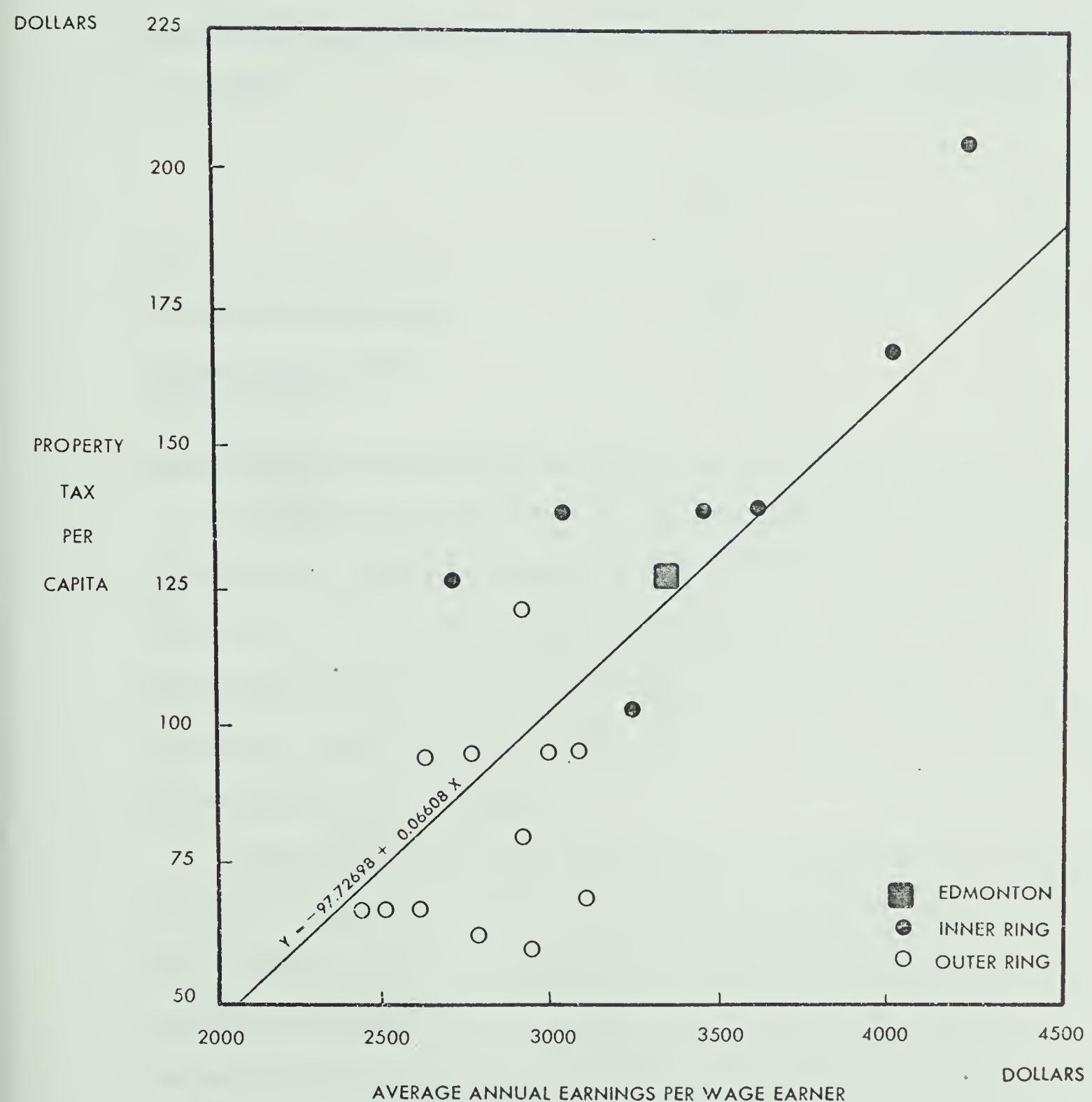


Figure 5.3

ties have lower incomes.

TABLE 5.2

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND AVERAGE INCOMES

Income	Coefficients of Correlation	
	PTC	ETR
Average Male Earnings	.790	-.176
Average Earnings Per Wage-Earner	.824	-.125

A comparison of the effective tax rate and the average earnings indicates that little association exists between these variables (Figure 5.4). However, the scatter diagram shows that a negative relationship exists between the effective tax rate and the average earnings if only the City of Edmonton and the inner ring municipalities are considered in the analysis.

An interpretation of the data is that the positive association between the property tax per capita and the average incomes is basically a result of the provincial revenue-sharing programs which are conducted in Alberta.⁷ Tax equalization payments to the poorer jurisdictions are proportionally higher than to the richer areas.

A second observation is that a negative association likely

⁷These programs were previously discussed in Chapter 3.

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
AVERAGE ANNUAL MALE EARNINGS

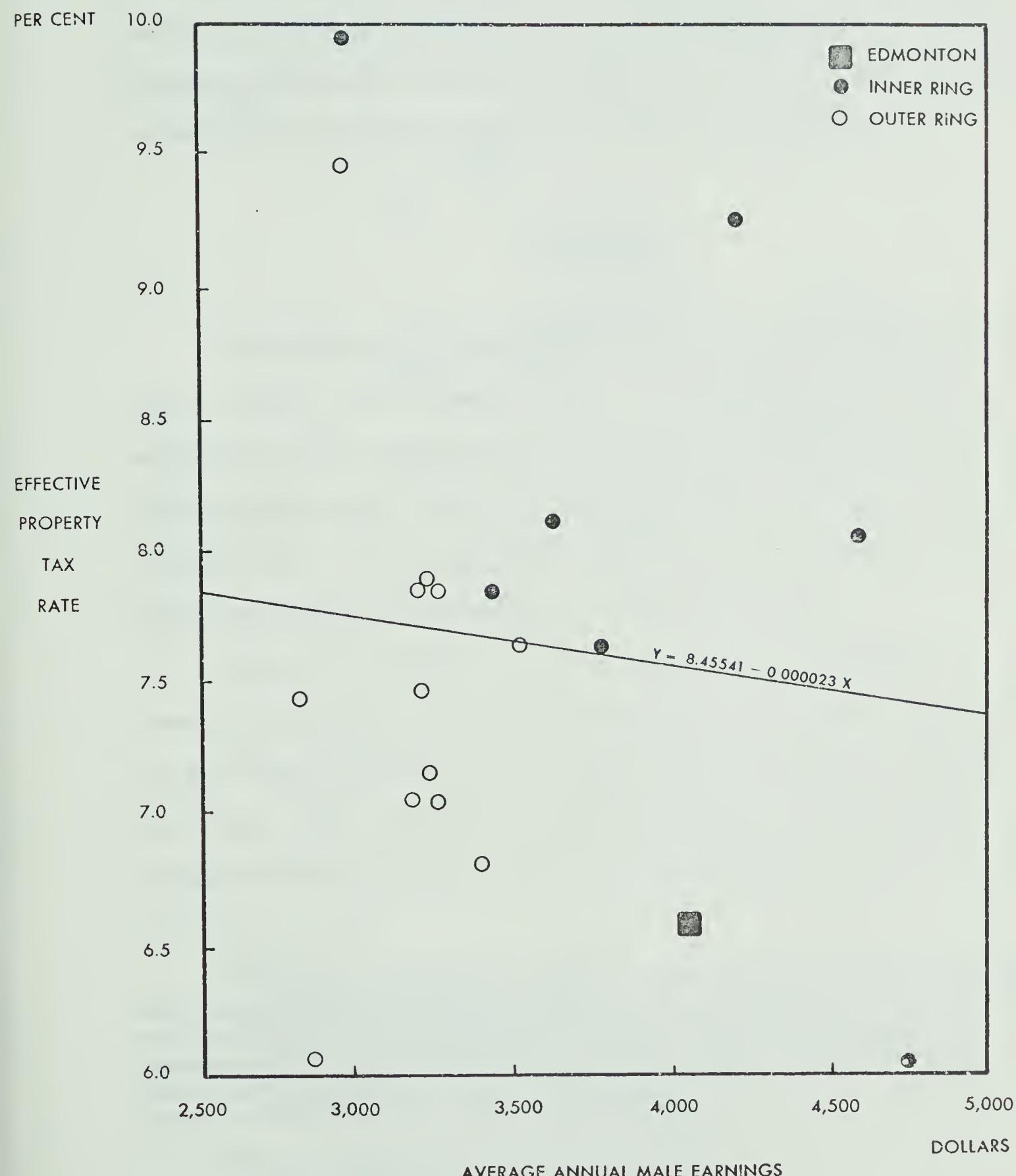


Figure 5.4

exists between the effective tax rate and average incomes, especially in the more urbanized municipalities. This suggests that the wealthiest communities, as based on the average earnings of their labour forces, are in fact characterized by the lowest property tax rates. The next section will examine the composition of the labour force in relation to the property tax levels within a municipality.

OCCUPATION

The composition of the labour force is a second index commonly used to define socio-economic status. The main purpose of this section will be to compare levels of property taxation with the proportion of the labour force employed in primary, secondary or tertiary activities.⁸ The comparison should also provide useful information concerning a municipality's economic activities.

Table 5.3 provides a summary of the labour force by the industrial divisions for the three subregions. The City of Edmonton has the lowest proportion of its labour force employed in primary activities, while the inner ring municipalities have the highest average for this division.⁹ The outer ring urban municipalities have

⁸"primary activities" include: agriculture, forestry, fishing, and trapping, mining and quarrying; "secondary activities" include: manufacturing and construction; "tertiary activities" include: transportation and communication, trades, finance and insurance, public administration. Source: Classification as used in Canada, The Dominion Bureau of Statistics, 1961 Census.

⁹This finding is directly attributable to the oil industry which is classified as a primary activity.

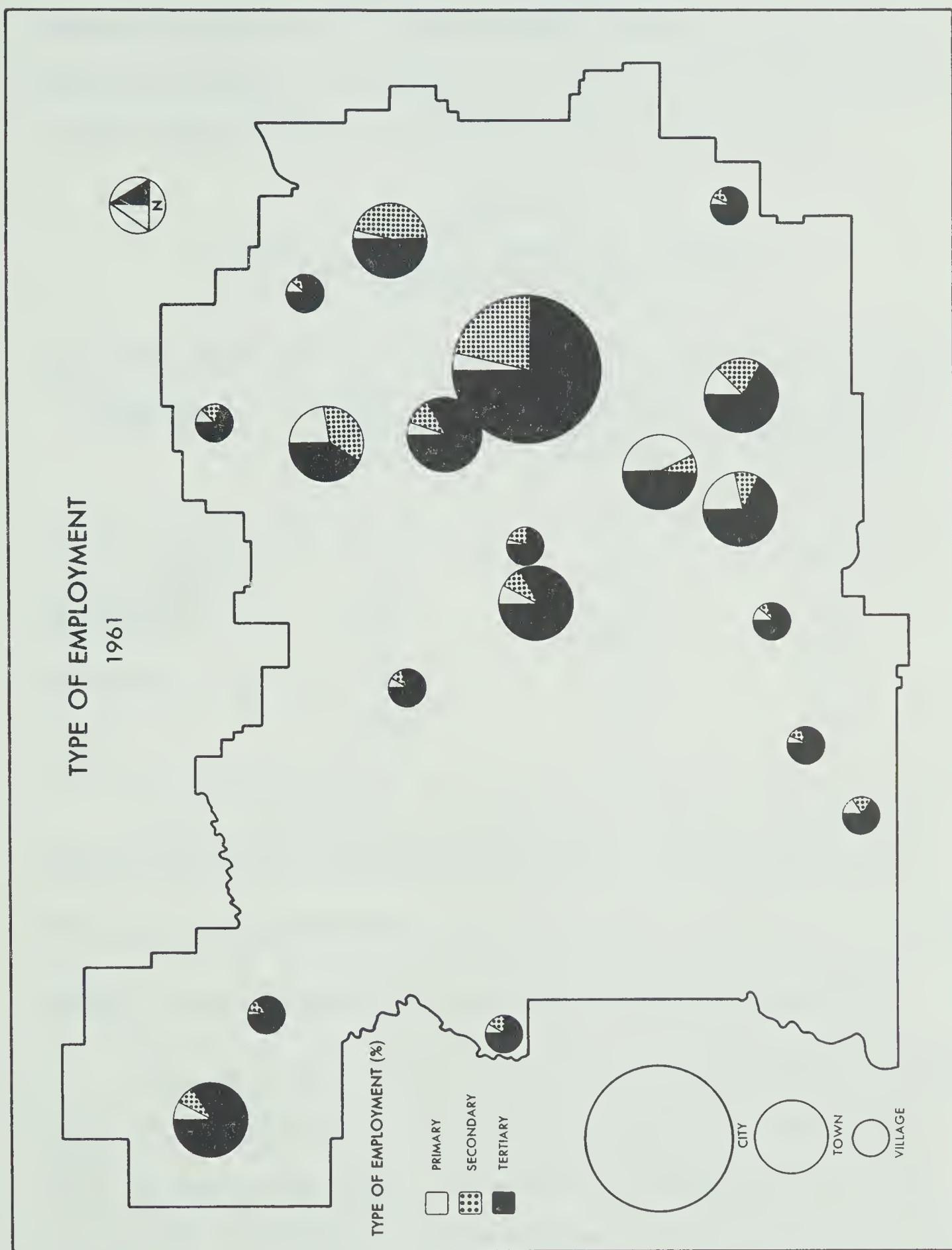


Figure 5.5

the highest proportion of their labour force employed in tertiary activities (Figure 5.5). These municipalities serve primarily as agricultural service centres and as a result, a substantial proportion of their labour forces are employed in retail trade outlets.

TABLE 5.3

LABOUR FORCE BY INDUSTRIAL DIVISIONS
BY SUBREGIONS, 1961

Subregion	Primary Activities (per cent)	Secondary Activities (per cent)	Tertiary Activities (per cent)
City of Edmonton	2.89	22.29	74.82
Inner Ring	14.11	21.22	64.67
Outer Ring	9.58	12.44	77.98
Region	10.85	16.19	72.91

Source: The data were obtained from: Canada, The Dominion Bureau of Statistics, Enumeration Area Point-Out Statements, 1961.

Property Tax Levels and the Labour Force by Source of Employment

The data listed in Table 5.4 indicate that the property tax per capita is associated with the percentage composition of the labour force by types of employment. Municipalities characterized by high proportions of employment in manufacturing and construction activities have higher average property taxes per capita. Conversely, high pro-

portions of employment in tertiary activities are accompanied by lower property taxes per capita. No significant correlations are obtained between the effective tax rate and the types of employment.

TABLE 5.4

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND COMPOSITION OF THE LABOUR
FORCE BY INDUSTRIAL DIVISIONS

Percentage Composition of the Labour Force by Industrial Divisions	Coefficients of Correlation	
	PTC	ETR
Primary Activities	.075	.205
Secondary Activities	.504	-.123
Tertiary Activities	-.461	-.073

The proportion of employment in secondary activities corresponds closely to the actual industrial activities within a municipality. It was shown in Chapter II that the property tax per capita was positively associated with the proportion of industrial assessments in a municipality's tax base. Figure 5.6 indicates that a similar relationship exists between the proportion of the labour force employed in these activities and the property tax per capita.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF LABOUR FORCE OCCUPIED IN SECONDARY ACTIVITIES

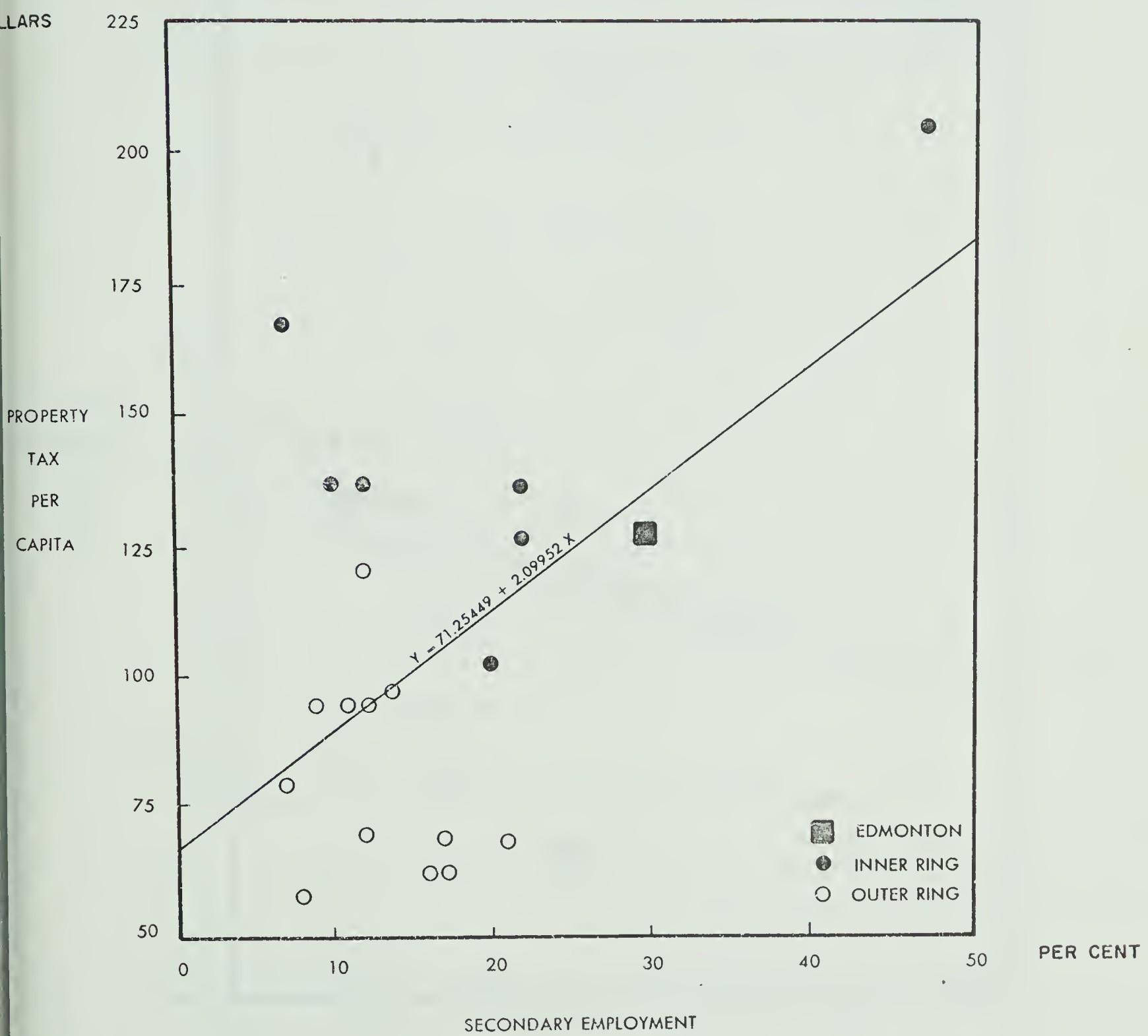


Figure 5.6

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
LABOUR FORCE OCCUPIED IN SECONDARY ACTIVITIES

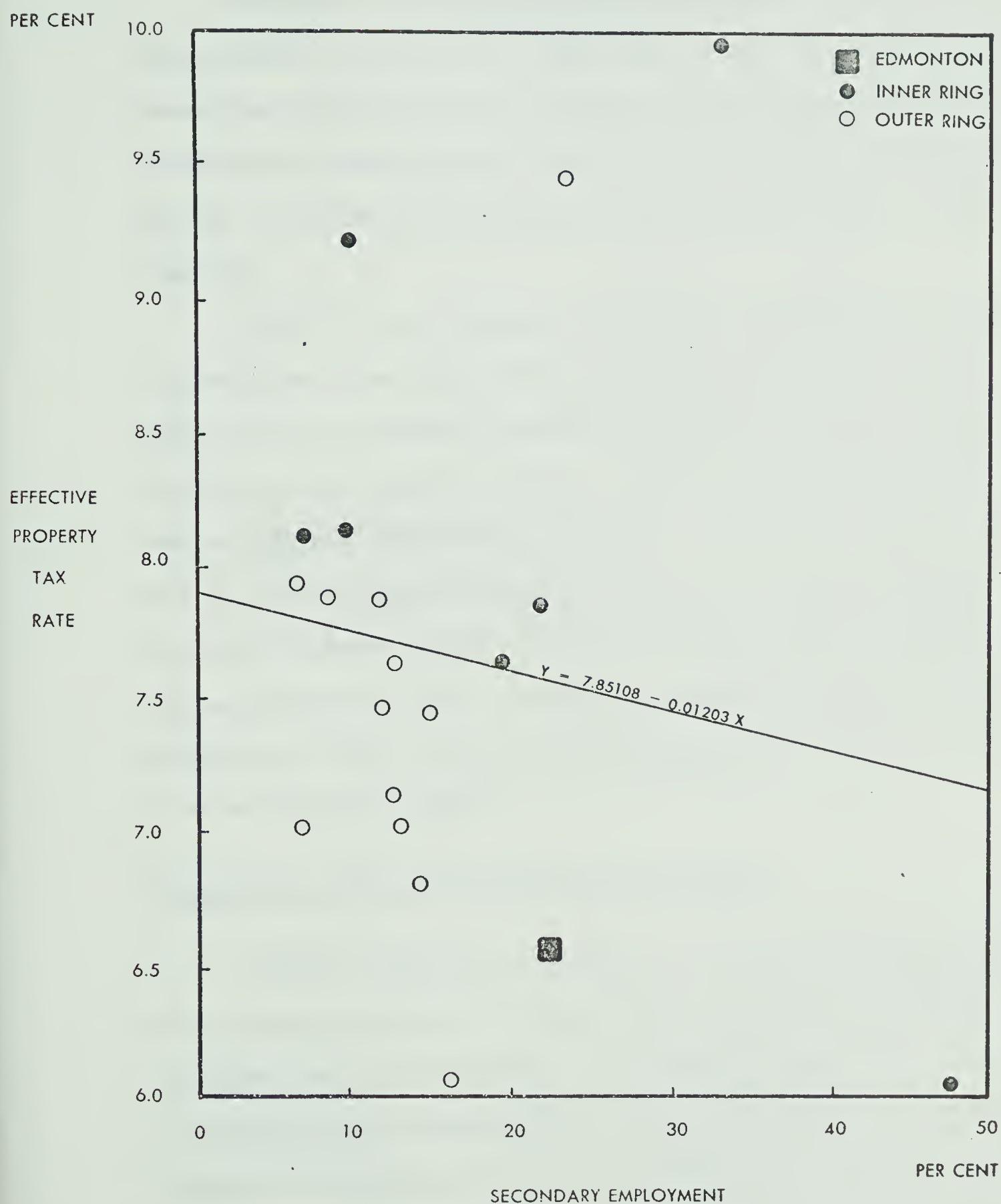


Figure 5.7

EDUCATION

Educational attainment is a third measure of a municipality's socio-economic composition. High levels of education are traditionally associated with high levels of incomes and increased employment in the tertiary employment sector. This section will study the association between a municipality's education levels and the levels of property taxation.

Table 5.5 lists the years of schooling for the population currently not attending an educational institution. The City of Edmonton has the highest percentage composition in two categories--high school and post-high school. The outer ring municipalities have the next highest educational attainment. The inner ring municipalities had the lowest average education in 1961 of all three subregions although the recent influx of population should have increased their average education levels. Therefore, comparative results between property tax levels and the 1961 education levels should be interpreted with considerable caution.

Property Tax Levels and Educational Attainment

The main conclusion from Table 5.6 is that the municipalities having higher property taxes per capita also tend to be characterized by higher levels of educational achievement (Figure 5.8). Conversely, the municipalities characterized by higher effective tax rates are characterized by lower levels of educational achievement (Figure 5.9). These findings are similar to the results obtained when the property

tax levels were compared to the income and occupation indices.

TABLE 5.5
EDUCATIONAL ATTAINMENT
BY SUBREGIONS, 1961

Subregion	Less Than Grade 5 (per cent)	Grades 5-8 (per cent)	High School (per cent)	Post High School (per cent)
City of Edmonton	9.88	25.22	55.95	8.95
Inner Ring	30.42	27.08	36.82	5.70
Outer Ring*	28.85	29.92	37.68	5.38
Region	28.40	27.57	38.32	5.69

*Does not include Bon Accord

Source: The data were obtained from: Canada, The Dominion Bureau of Statistics, Enumeration Area Print-Out Statements, 1961.

TABLE 5.6
COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND EDUCATIONAL ATTAINMENT

Educational Attainment	Coefficients of Correlation	
	PTC	ETR
Less than Grade 5	-.121	.441
Grades 5-8	-.550	.201
High School	.268	-.398
Post High School	.353	-.270
More than Grade 8	.441	-.422

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF ADULT POPULATION HAVING MORE THAN GRADE EIGHT EDUCATION

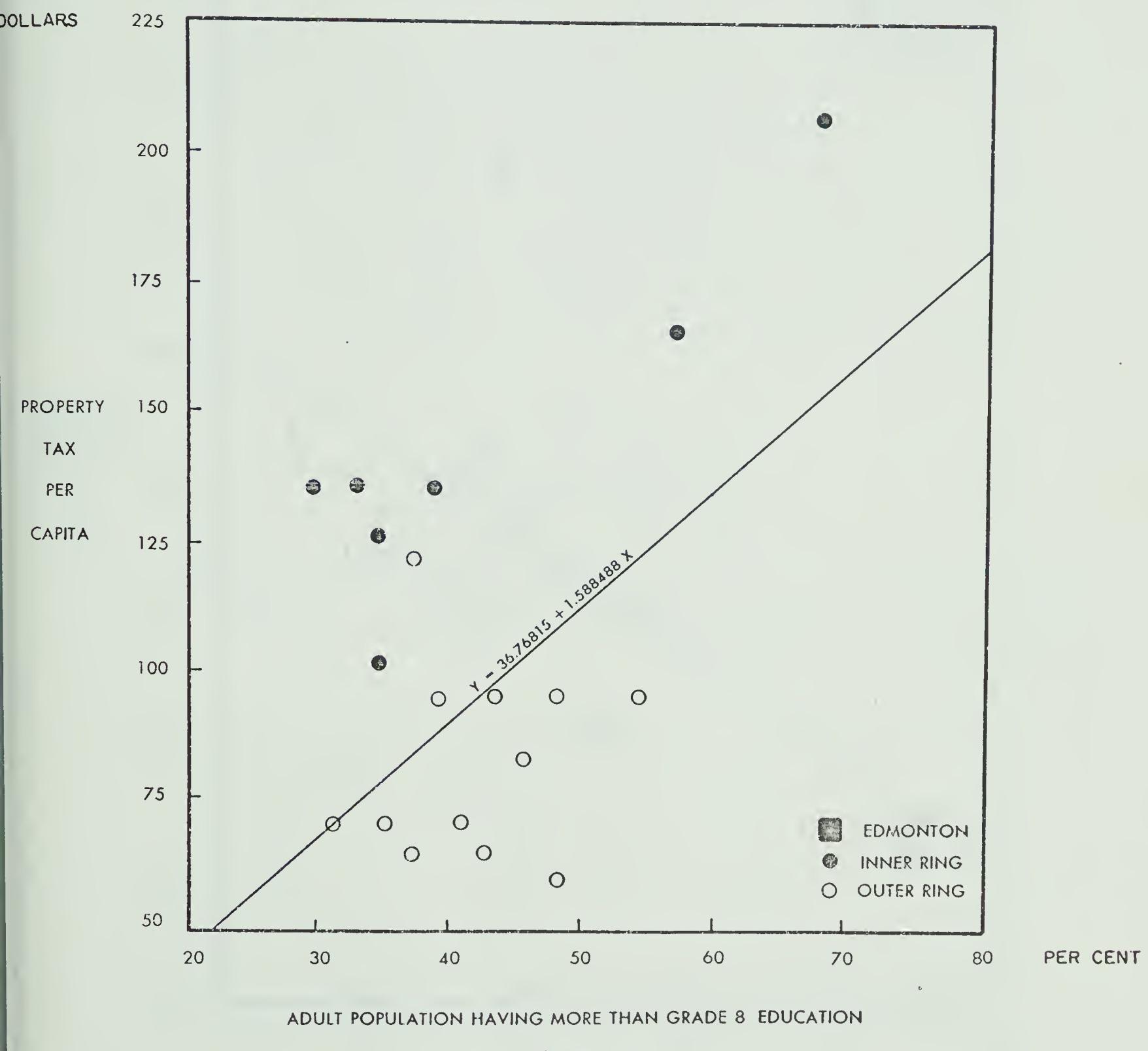
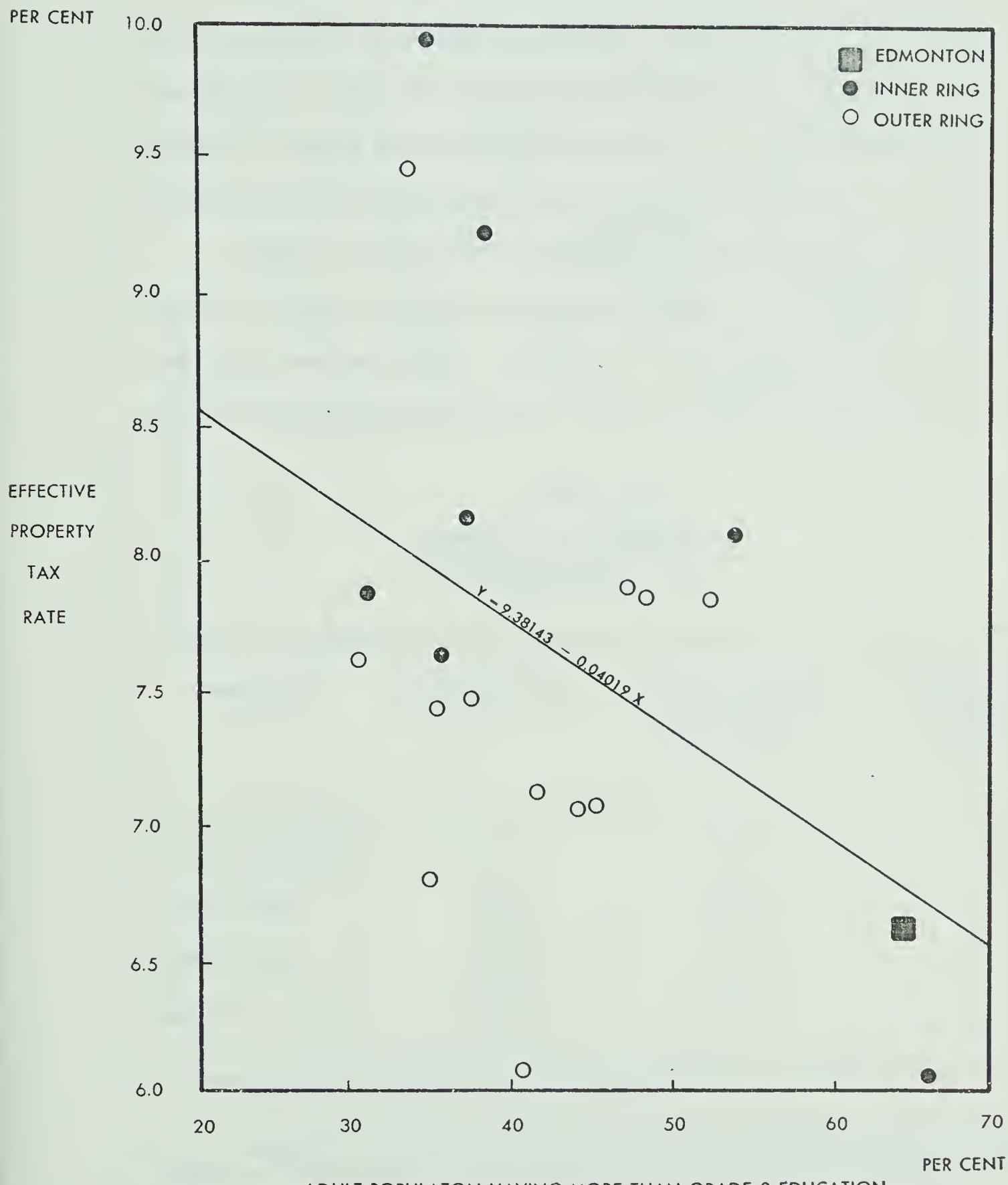


Figure 5.8

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST

PROPORTION OF ADULT POPULATION HAVING MORE THAN GRADE EIGHT EDUCATION



ADULT POPULATION HAVING MORE THAN GRADE 8 EDUCATION

Figure 5.9

HOUSING CHARACTERISTICS

The final topic to be discussed in this chapter deals with various aspects of housing and their relationship to the property tax levels. Two types of housing characteristics are analyzed: the number of single detached dwelling units as a proportion of the total housing stock, and the proportion of owner-occupied dwelling units.

Table 5.7 lists the subregional classification of the proportions of single detached and owner-occupied dwelling units compared to the total housing stock. The City of Edmonton has the lowest proportion of single detached homes, while the outer ring municipalities

TABLE 5.7
HOUSING CHARACTERISTICS
BY SUBREGIONS, 1966

Subregion	Total Housing Stock	Single Detached Housing Units (per cent)	Owner-Occupied Housing Units (per cent)
City of Edmonton	105,016	63.35	60.29
Inner Ring*	4,779	85.07	79.89
Outer Ring	1,487	91.60	76.91
Region	111,282	88.05	76.98

*Spruce Grove data not available.

Source: The data were obtained from: Canada, The Dominion Bureau of Statistics, Enumeration Area Print-Out Statements, 1966.

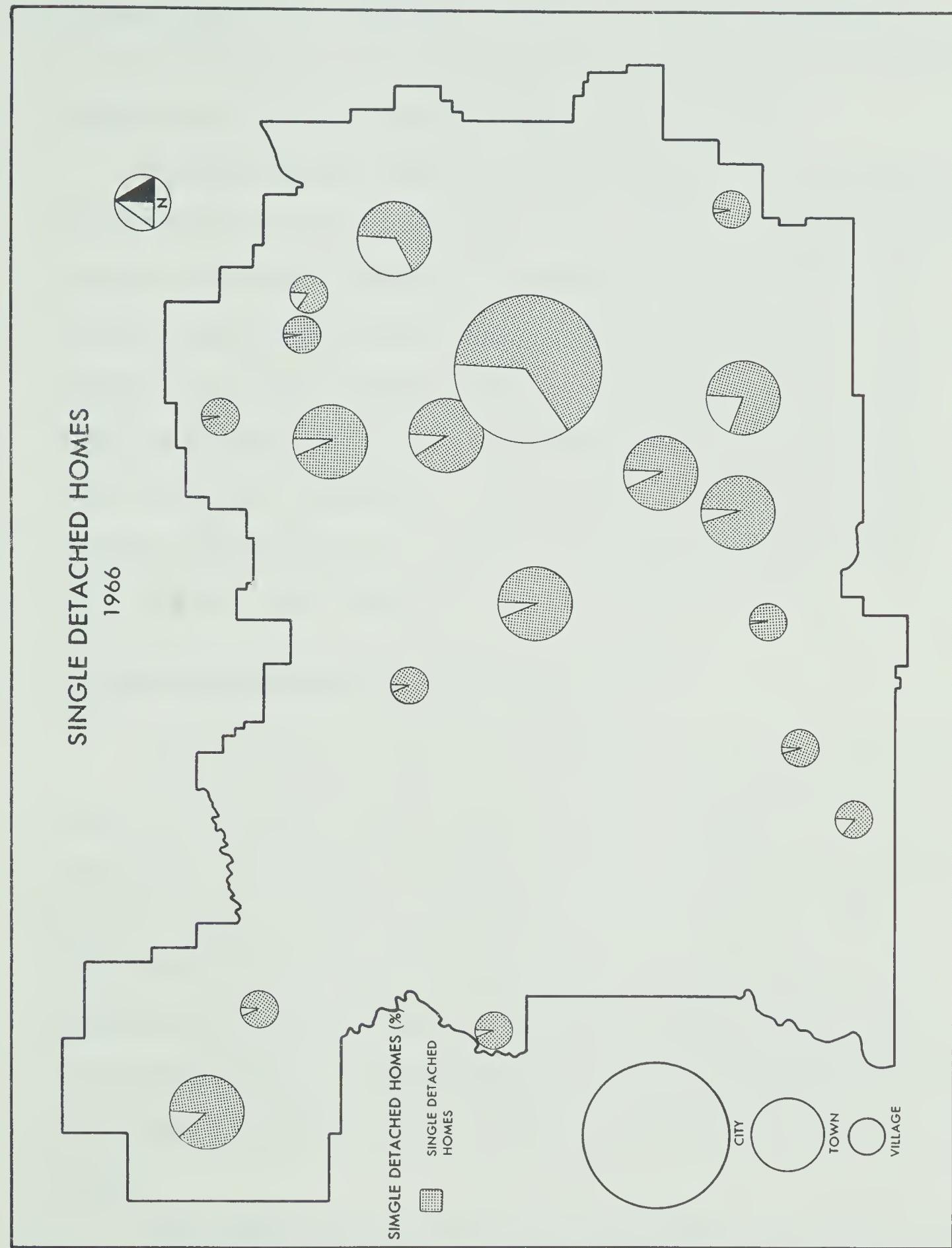


Figure 5.10

have the highest rate of single detached homes (Figure 5.10). The explanation for this development is that the larger municipalities are characterized by more intensive residential densities in the form of high-rises, walk-up apartments, and row housing units.

Similar regional patterns are also shown for the proportion of owner-occupied dwelling units (Table 5.7). The only exception is that the inner ring municipalities have a slightly higher percentage of owner-occupied dwelling units than the outer ring municipalities. One explanation for this finding is that the recent residential growth which has occurred in the inner ring municipalities has consisted almost entirely of homeowners. These residents have been attracted to these communities due to a number of factors, including cheaper land costs and a more attractive, suburban style of living.

Property Tax Levels and Housing Characteristics

The relationship between the property tax per capita and the proportion of single detached homes is shown in Figure 5.11. The correlation coefficient is negative in sign, indicating that higher property taxes per capita are found in the municipalities having smaller proportions of single detached homes, or conversely, that municipalities having smaller proportions of single detached homes are characterized by increased property taxes per capita (Table 5.8). The association between the two variables is relatively weak ($r = -.424$).

The positive correlation coefficient between the effective tax rate and the proportion of single-detached homes shows an average

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF SINGLE DETACHED HOMES

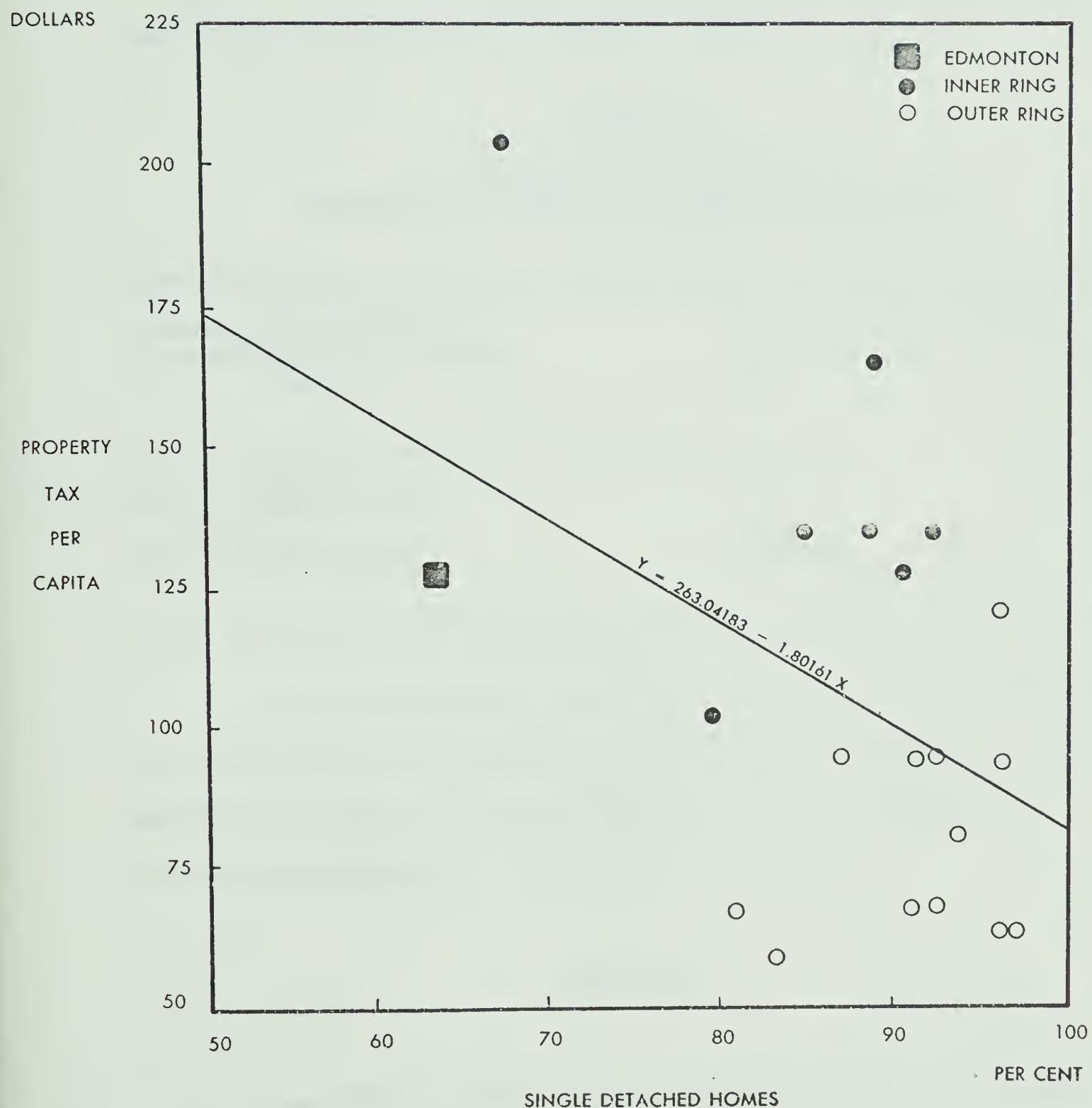


Figure 5.11

tendency for municipalities with higher proportions of single-detached homes to be characterized by increased effective tax rates. Again, the association is relatively low although Figure 5.12 illustrates that a better correlation would be obtained if only the City of Edmonton and the inner ring municipalities would be used in the analysis.

TABLE 5.8
COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND HOUSING CHARACTERISTICS

Housing Characteristic (Proportion of Total Housing Stock)	Coefficients of Correlation	
	PTC	ETR
Single Detached Homes	-.424	.363
Owner-Occupied Homes	-.011	.363

A scatter diagram for the effective tax rate and the proportion of owner-occupied dwelling units is illustrated in Figure 5.13. The relationship between the two variables is positive although the correlation coefficient is relatively low ($r = .363$).

CONCLUSION

A comparison of the property tax levels and the socio-economic indices has indicated several important relationships. An accurate estimate of the property tax per capita can be obtained by studying the

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
PROPORTION OF SINGLE DETACHED HOMES

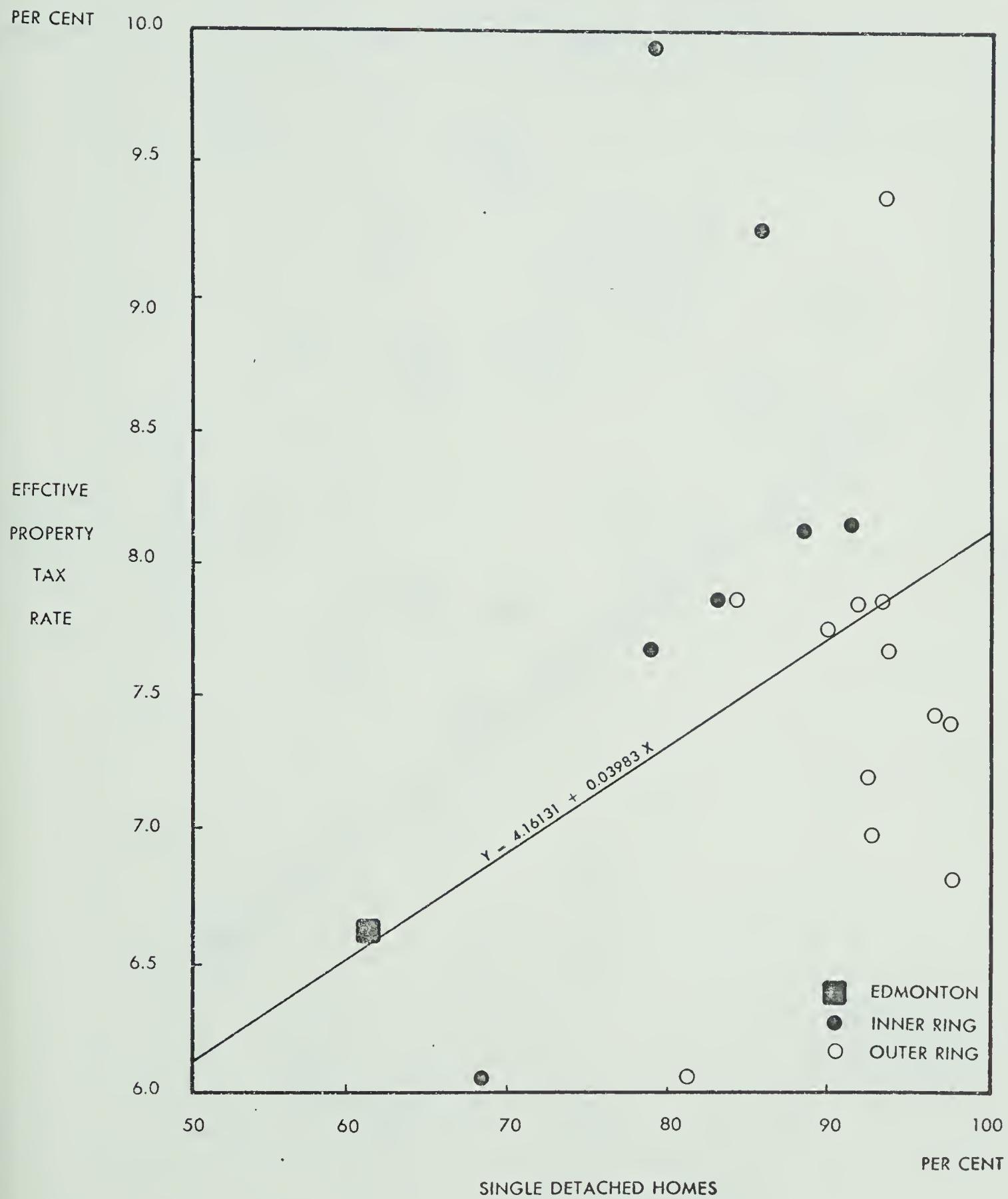


Figure 5.12

REGRESSION LINE FOR EFFECTIVE PROPERTY TAX RATE AGAINST
PROPORTION OF OWNER-OCCUPIED HOMES

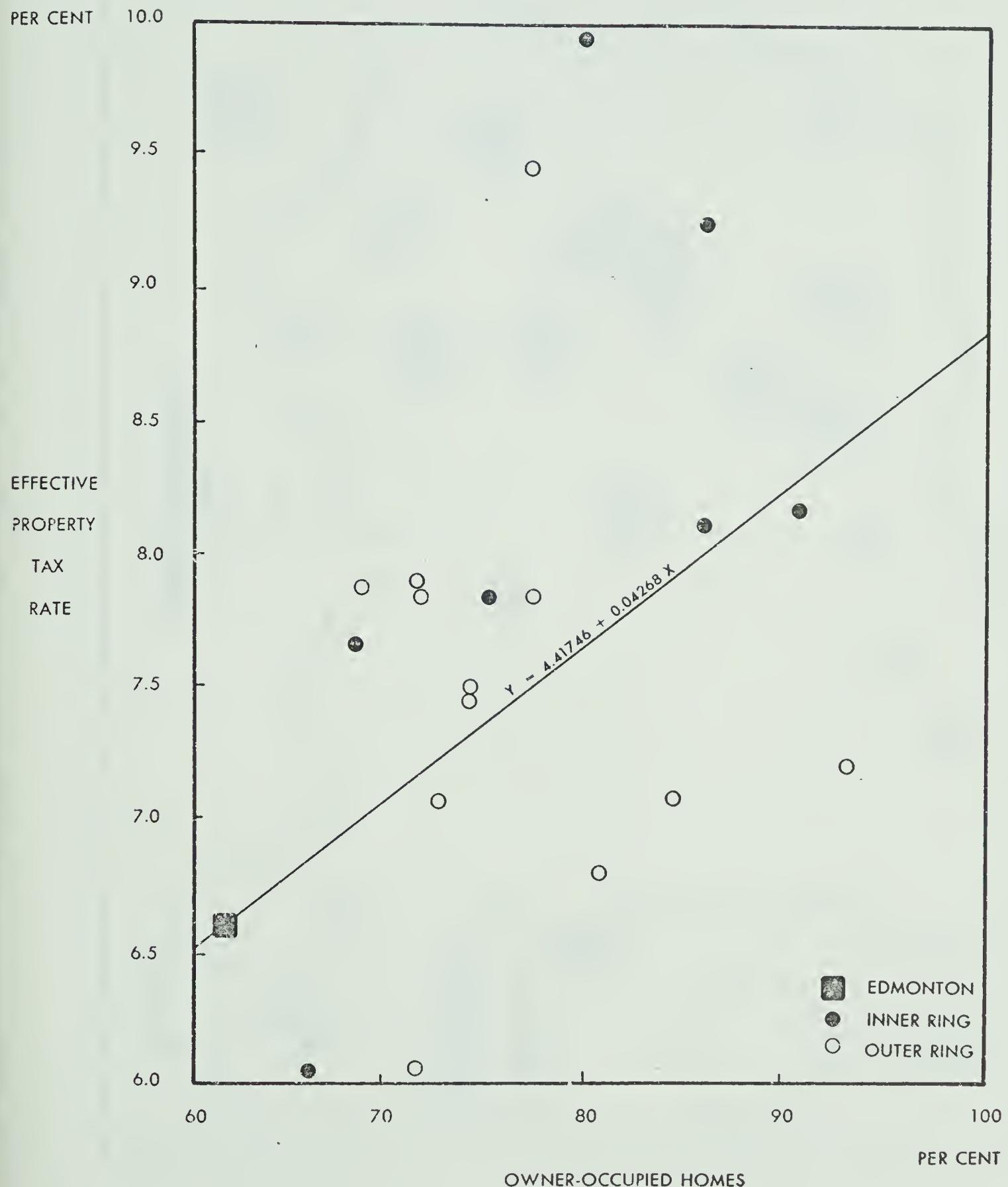


Figure 5.13

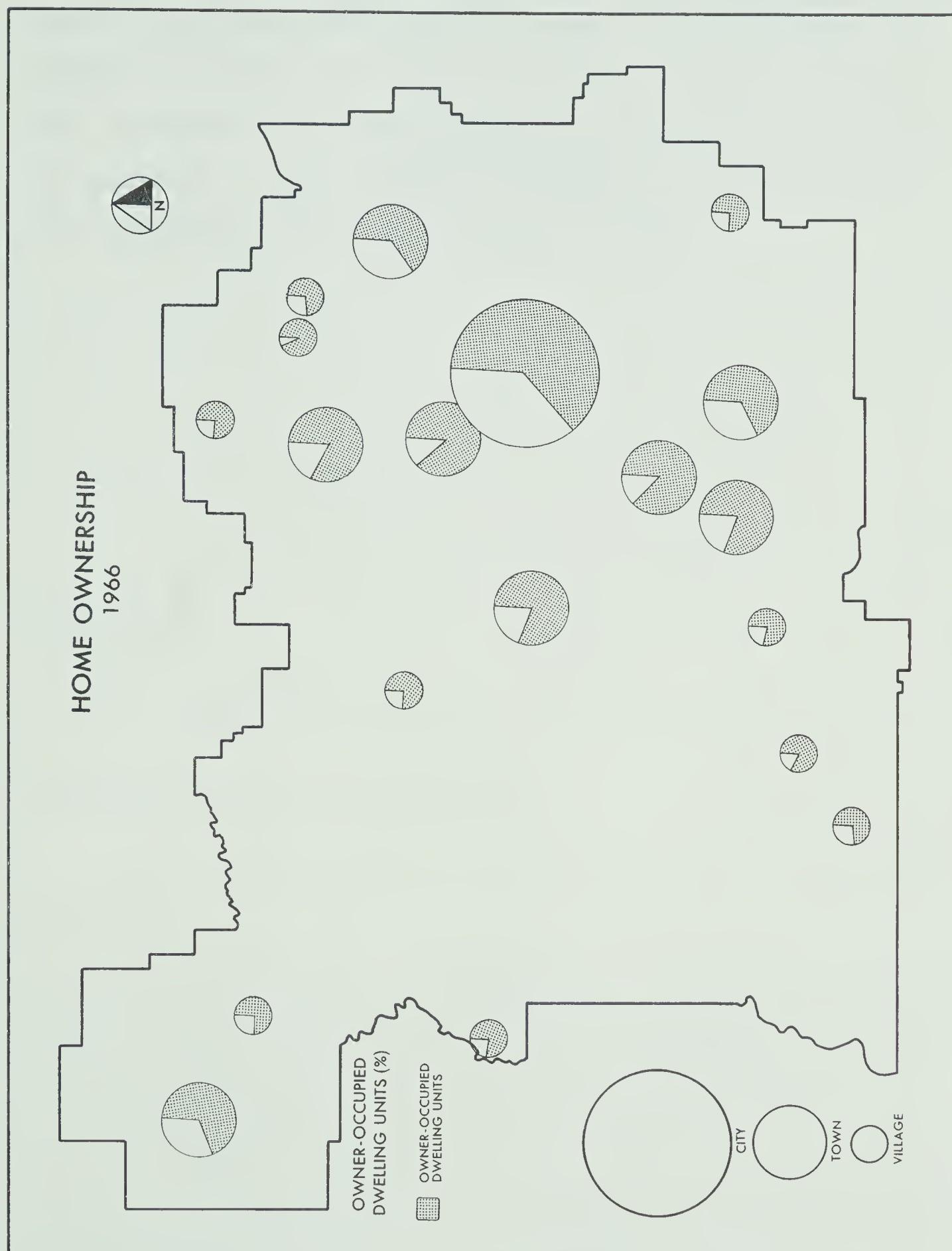


Figure 5.14

average male earnings and average income per wage earner for each municipality. Less significant associations were also shown between both property tax measures and various occupation and education indices. A final observation is that the proportion of single detached homes and the proportion of owner-occupied dwelling units provide relatively "poor" estimates of the average property tax levels.

Chapter VI

PROPERTY TAX LEVELS: LAND-USE INDICES

A municipality's land-use patterns are a reflection of its zoning policies, property taxation, and market values.¹ Current land-use patterns may also be explained by historical influences, especially by the lack of organized planning programs. The influence of historical events and zoning policies are considered to be beyond the scope of this study.² The relationship between property tax levels and current land-use patterns, along with the assessed land valuations, are examined in this chapter.

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL LAND-USE

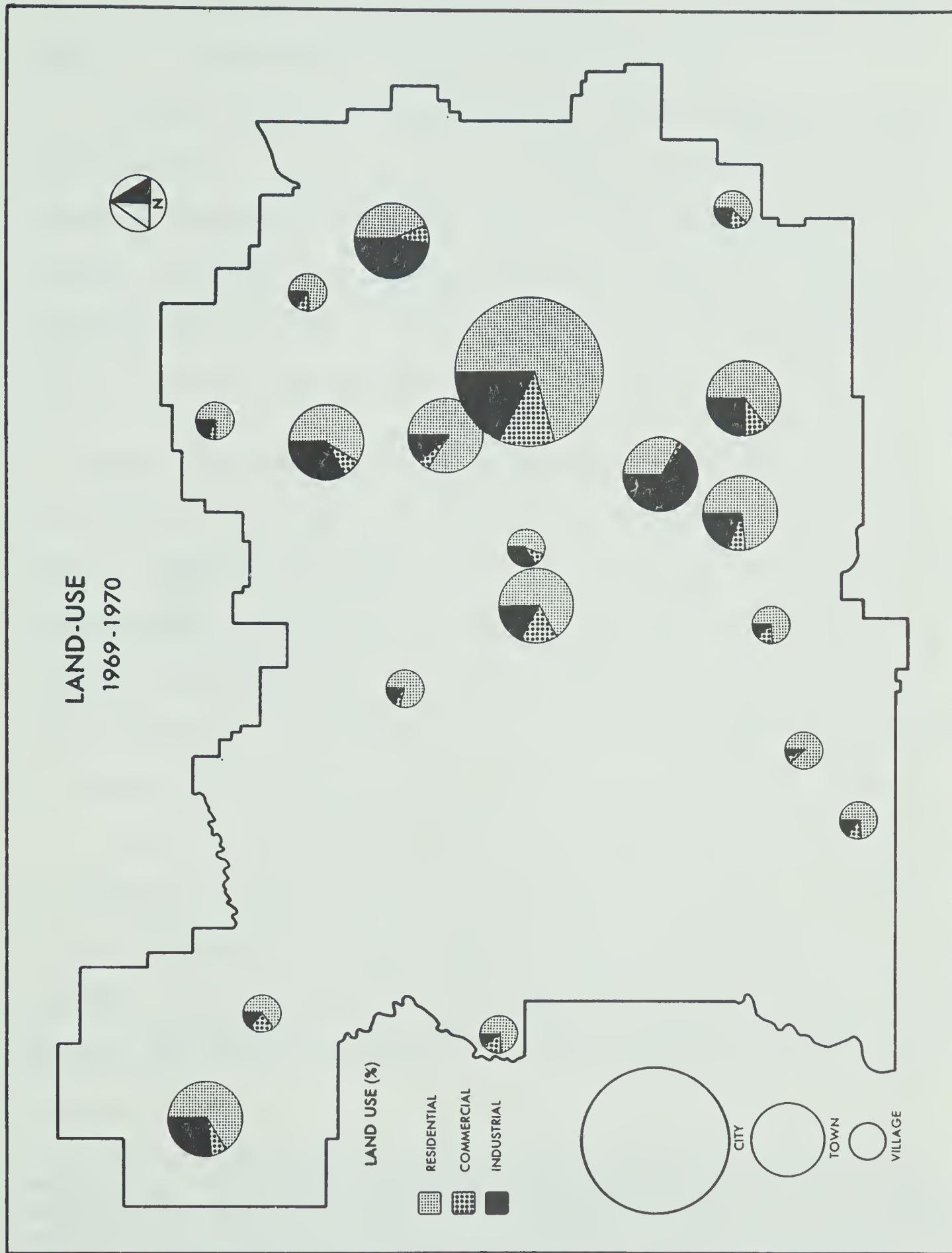
Land-Use Classification by Proportions

The classification used in the analysis lists the proportion of

¹"Zoning represents a determination by public agencies as to the proper kind and character of land use; taxation represents the claim of the public treasury upon the use of land; the use itself is perhaps chiefly a market phenomenon, but subject to a greater or lesser degree of control and modification by the two other major factors."
J. P. Pickard, "Changing Urban Land Uses as Affected by Taxation", Research Monograph No. 6, Urban Land Institute, 1962, p. 32.

²Personal communications with Mr. N. Giffen, the Director of the Edmonton Regional Planning Commission, revealed that both zoning and development control was practiced in the urban municipalities. Their influence on actual land-use patterns would be difficult to ascertain.

Figure 6.1



residential, commercial, and industrial land-use. The total area allocated for residential, commercial, and industrial purposes corresponds to a municipality's taxable, built-upon area.³

Table 6.1 provides a summary of the land-use patterns for the three subregions. The outer ring municipalities have the highest proportion of residential land-use, followed closely by the City of Edmonton. The inner ring municipalities have the highest proportion of industrial area. Figure 6.1 illustrates that a substantial variation exists in the land-use patterns for the individual municipalities.

1) Property Tax Levels and Land-Use Patterns. A comparison between the property tax per capita and the proportion of residential land-use yields a negative correlation (Table 6.2). This finding indicates that higher property taxes per capita are on the average found in the municipalities characterized by the smaller proportion of residential land-use. Conversely, lower property taxes per capita are generally recorded for municipalities having larger proportions of residential land-use.

Figure 6.2 illustrates that a wide range exists in the proportion of residential land-use for the inner ring municipalities. The outer ring municipalities generally display similar proportions of residential land-use. The distribution of means around the regression line indicates that the proportion of residential land-use provides a reasonably good

³A detailed land-use classification, distinguishing between residential, commercial, industrial, institutional, utilities, vacant, and non-developed land is listed in the Appendix, Table 13. Preliminary analyses indicated that only the residential, commercial, and industrial land classifications were associated with the property tax levels.

TABLE 6.1

RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL LAND-USE
PERCENTAGE COMPOSITION
BY SUBREGIONS, 1969-1970

Subregion	Percentage Composition		
	Residential Land-Use	Commercial Land-Use	Industrial Land-Use
City of Edmonton*	69.44	11.11	19.44
Inner Ring	57.70	9.42	32.56
Outer Ring**	72.71	11.26	15.00
Region	67.29	11.11	21.32

* Based on 1961 data

** Does not include Bon Accord

Source: The data were calculated from information obtained through the Edmonton Regional Planning Commission and the Provincial Planning Branch of the Department of Municipal Affairs.

TABLE 6.2

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND
RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL AREA
BY PERCENTAGE COMPOSITION

Land-Use by Percentage Composition	Coefficients of Correlation	
	PTC	ETR
Residential	-.689	-.054
Commercial	-.235	.151
Industrial	.695	-.012

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF RESIDENTIAL LAND-USE

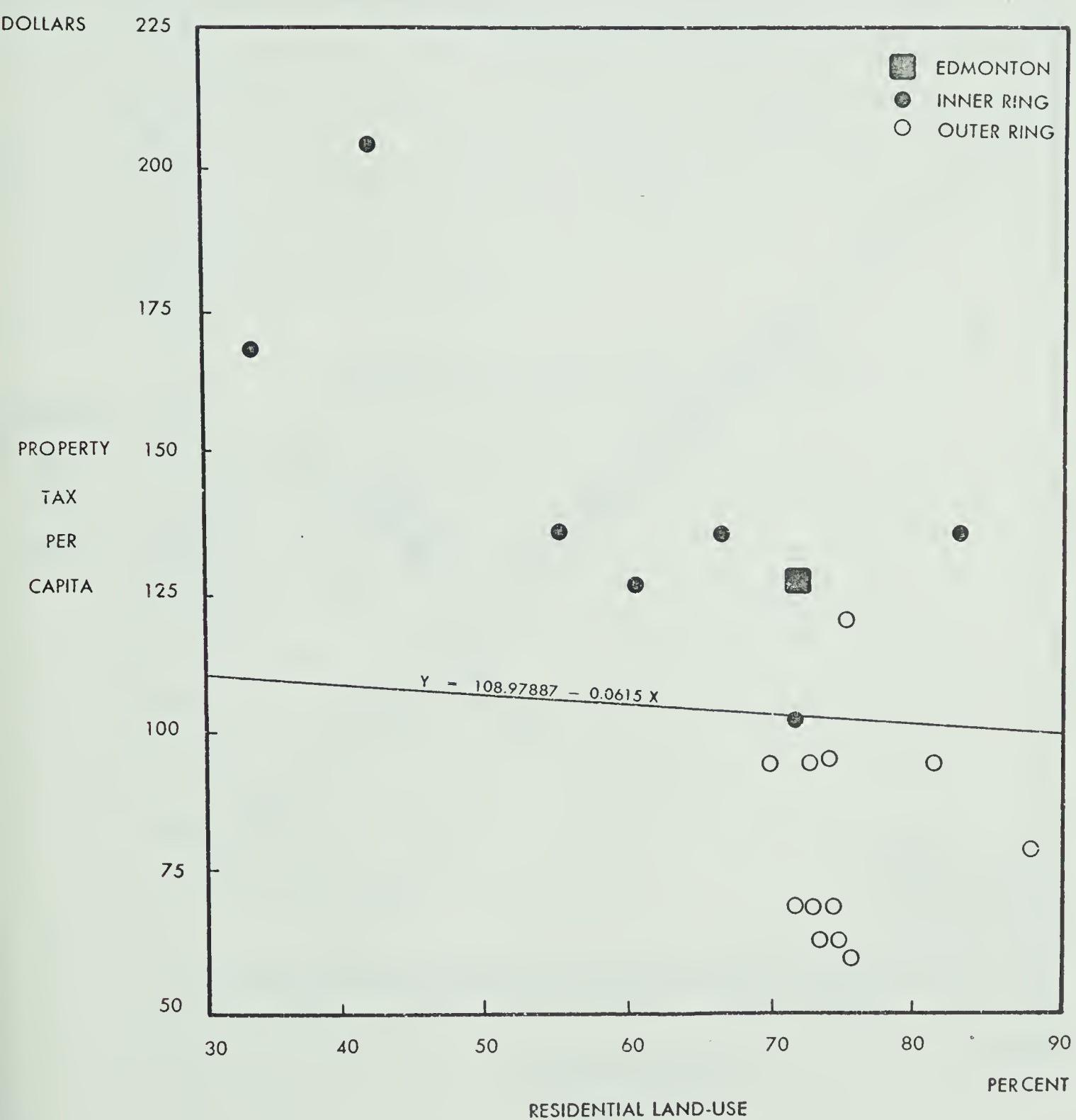


Figure 6.2

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF INDUSTRIAL LAND-USE

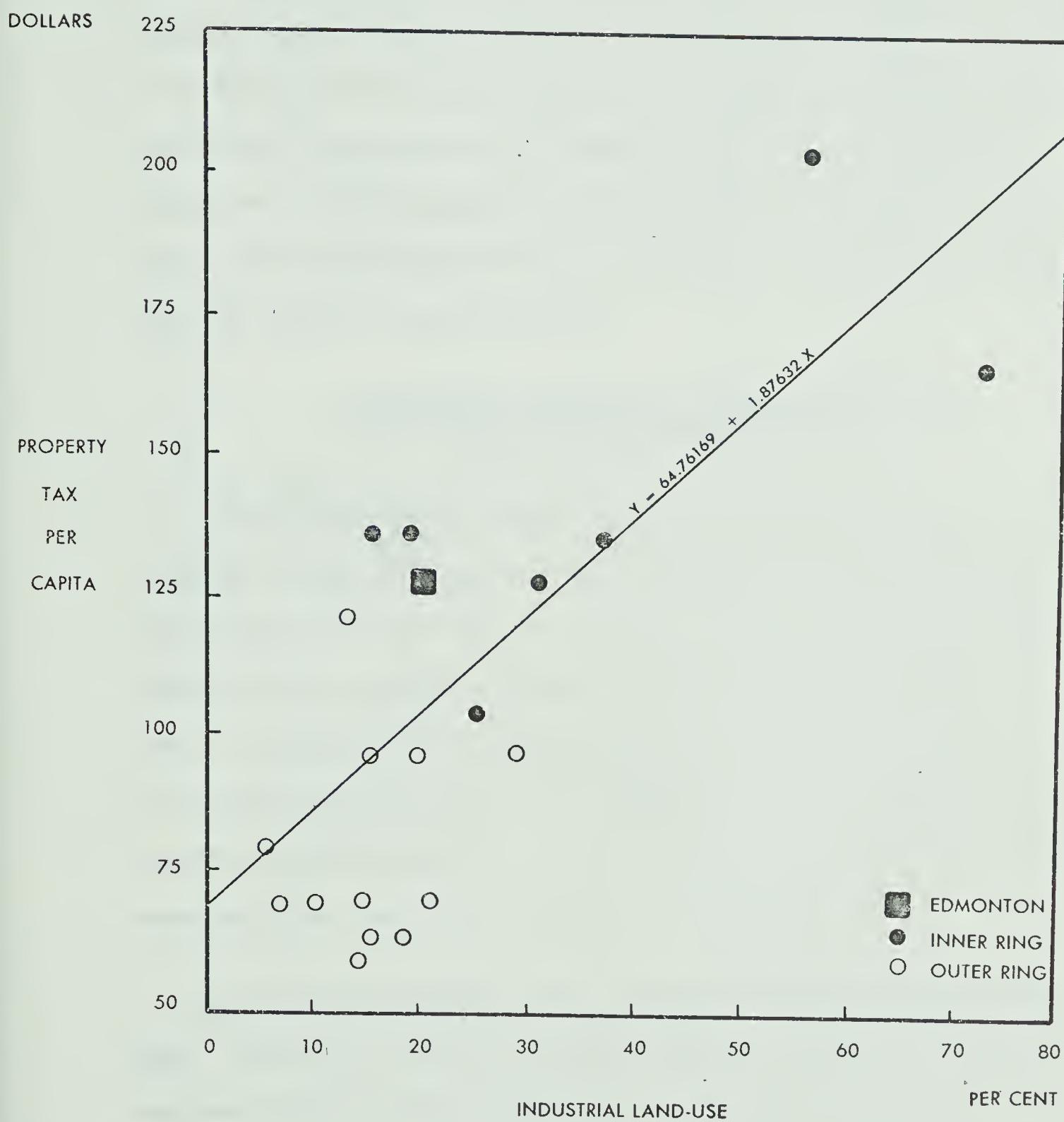


Figure 6.3

estimate of the property tax per capita.

A positive relationship exists between the property tax per capita and the proportion of industrial land-use (Figure 6.3). This indicates that high property taxes per capita are prevalent in municipalities having large proportions of industrial land-use. In summary, it is indicated that the property tax per capita is positively associated with the proportion of industrial land-use and negatively associated with the proportion of residential land-use. No significant relationships are obtained when the effective tax rates are compared with the land-use classifications.

Residential, Commercial, and Industrial Area Per Population-Assessment Base

The relationship between property tax levels and land-use patterns is also examined by using a different land-use classification. The property tax per capita is compared to the residential, commercial, and industrial area per resident population while the effective tax rate is compared to the land-use areas per equalized assessment base. The residential, commercial, and industrial area per resident population measure population density; the land-use areas expressed per equalized assessment base measure the density of property values.

1) Residential, Commercial, and Industrial Area Per Resident Population Base. Table 6.3 lists the land-use patterns, expressed as acres per 100 residents, for the three subregions. The City of Edmonton has the lowest amount of residential, commercial, and industrial land per population base. The inner ring municipalities have the highest rate, due

TABLE 6.3

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL AREA
PER RESIDENT POPULATION BASE
BY SUBREGIONS, 1969-1970***

Subregion	Residential Acres Per 100 Residents	Commercial Acres Per 100 Residents	Industrial Acres Per 100 Residents	Total Acres Per 100 Residents
City of Edmonton*	4.22	0.67	1.18	6.07
Inner Ring	5.88	1.03	3.90	10.82
Outer Ring**	6.36	1.05	1.37	8.77
Region	6.07	1.02	2.29	9.38

*Based on 1961 land-use data projected to 1969 by percentage composition of the total land area.

**Does not include Bon Accord.

***Also see the Appendix, Table 14.

Source: The land-use data were calculated from information obtained through the Edmonton Regional Planning Commission and the Provincial Planning Branch of the Department of Municipal Affairs. The population data were obtained from Alberta, The Department of Municipal Affairs, 1969 Financial Statements.

primarily to a large amount of industrial land per population base. As was previously shown, the inner ring municipalities have the lowest population density per residential area.⁴

The coefficients of correlation between the property tax per capita and the residential, commercial, and industrial area per 100 residents are listed in Table 6.4. A positive association is recorded between the property tax per capita and the industrial area per 100 residents. This finding is similar to the previous results when the property tax per capita was compared to the proportion of industrial area in a municipality. Figure 6.4 illustrates that the inner ring municipalities are characterized by a wide range in the amount of industrial area per 100 residents; all of the outer ring municipalities have similar amounts of industrial area per 100 residents.

2) Residential, Commercial, and Industrial Area Per Equalized Assessment Base. The residential, commercial and industrial areas per \$100,000 of equalized property assessments for the three subregions are listed in Table 6.5. The City of Edmonton has the lowest amount of residential, commercial, and industrial land per \$100,000 of equalized assessments. This result is to be expected since the City is characterized by a more intensive form of urban development.

The inner ring municipalities have an average of 6.42 acres of residential, commercial, and industrial land per \$100,000 of equalized property assessments; the outer ring municipalities have an average of

⁴See Chapter IV--"Population Per Residential Area".

8.35 acres per \$100,000 of equalized property assessments. The inner ring municipalities are again characterized by the highest rate of industrial land-use while the outer ring municipalities have the highest rate of residential land-use.

TABLE 6.4

COEFFICIENTS OF CORRELATION
PROPERTY TAX LEVELS AND
RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL AREA
PER POPULATION-ASSESSMENT BASE

Land-Use Indices	Coefficients of Correlation	
	PTC	ETR
Residential	.248	.293
Commercial	-.074	.317
Industrial	.593	.272
Total	.271	.410

A summary of the coefficients of correlation between the effective tax rate and the residential, commercial, and industrial area per \$100,000 of equalized assessments is listed in Table 6.4. Although the association between these variables is relatively weak, it appears that the highest effective tax rates are on the average recorded in the municipalities having the lowest density of property values.⁵ The sub-

⁵

A similar observation was made in Chapter II when the effective tax rate was compared with the equalized assessments per built-upon acre.

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
INDUSTRIAL AREA PER ONE HUNDRED POPULATION

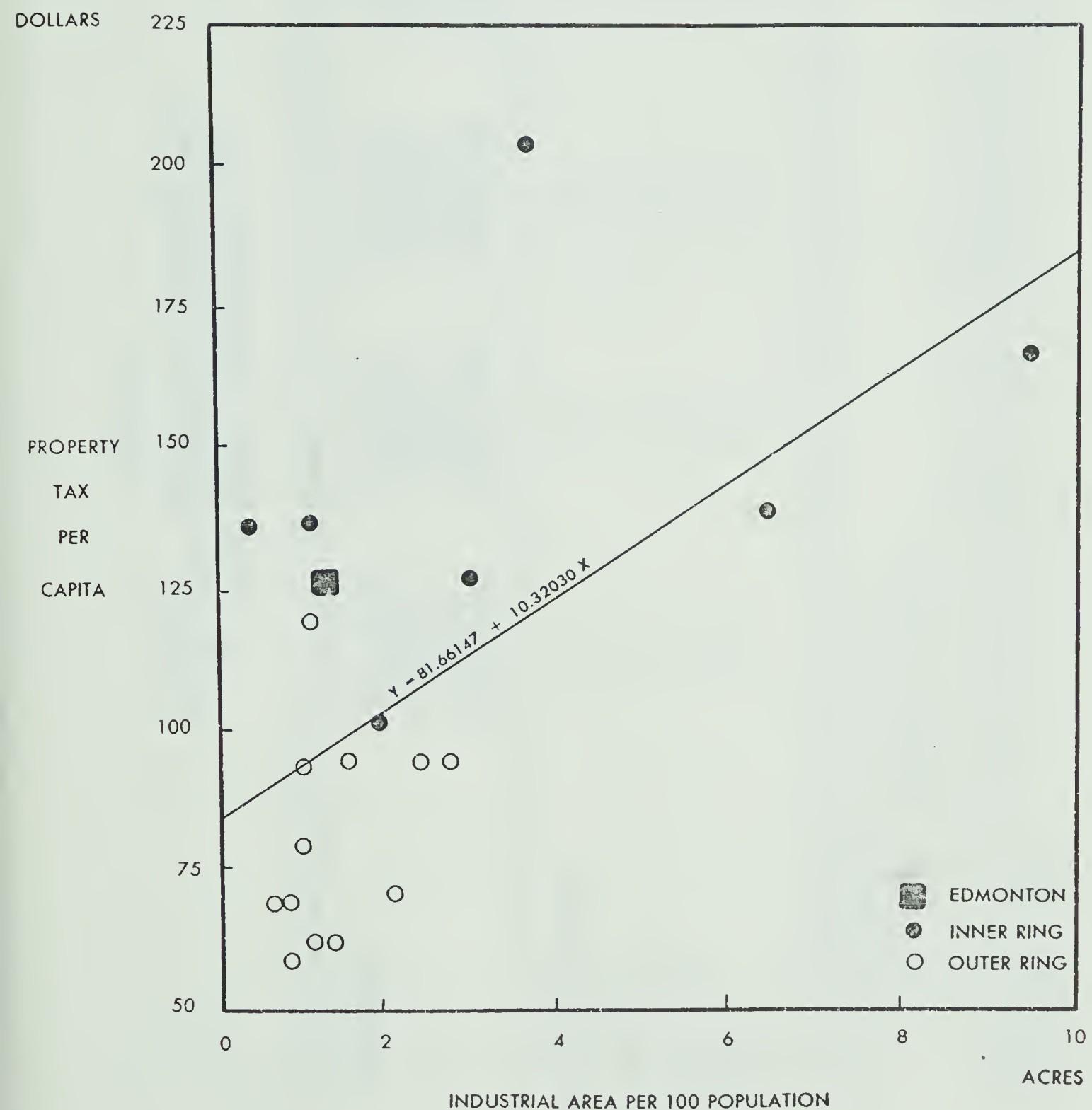


Figure 6.4

TABLE 6.5

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL AREA
PER \$100,000 EQUALIZED ASSESSMENT BASE
BY SUBREGIONS, 1969-1970**

Subregion	Residential Acres Per \$100,000 Equalized Assessments	Commercial Acres Per \$100,000 Equalized Assessments	Industrial Acres Per \$100,000 Equalized Assessments	Total Acres Per \$100,000 Equalized Assessments
City of Edmonton*	2.27	0.36	0.64	3.27
Inner Ring	3.63	0.64	2.15	6.42
Outer Ring**	5.99	1.07	1.32	8.35
Region	4.92	0.88	1.59	7.39

*Based on 1961 land-use data projected to 1969 by percentage composition of the total land area.

**Does not include Bon Accord.

***Also see the Appendix, Table 14.

Source: The land-use data were calculated from information obtained through the Edmonton Regional Planning Commission and the Provincial Planning Branch of the Department of Municipal Affairs. The equalized assessments were obtained from the Alberta Assessment Equalization Board.

classifications of residential, commercial, or industrial area per \$100,000 of equalized property assessments provide little additional explanation for the effective tax rate.

LAND ASSESSMENTS

It has been shown that a definite relationship exists between a municipality's land-use patterns and its land values.⁶ The aim of this section will be to analyze the relationship between the property tax levels and the assessed land valuations. It is observed from Table 6.6 that the inner ring municipalities have the highest proportion of residential land assessments, and the smallest proportion of industrial land assessments.⁷

A comparison with the data listed in Tables 6.1 and 6.6 indicates that land assessments vary inversely to the actual land-use patterns. For example, the inner ring municipalities have only 57.70 per cent of land area classified as residential use although residential land assessments provide 73.96 per cent of their taxable, built-upon land assessments. Conversely, this subregion has an average of 32.56 per cent of its land area as industrial use yet the assessed valuation amounts to

⁶"It is generally agreed that land values are of prime importance in urban land-use studies since they both determine and reflect the character and intensity of land-use." R. E. Murphy, The American City--An Urban Geography, New York, McGraw-Hill Book Company, 1966, p. 203.

⁷The land assessments were classified as residential, commercial, or industrial properties according to the main activity listed on the assessment forms.

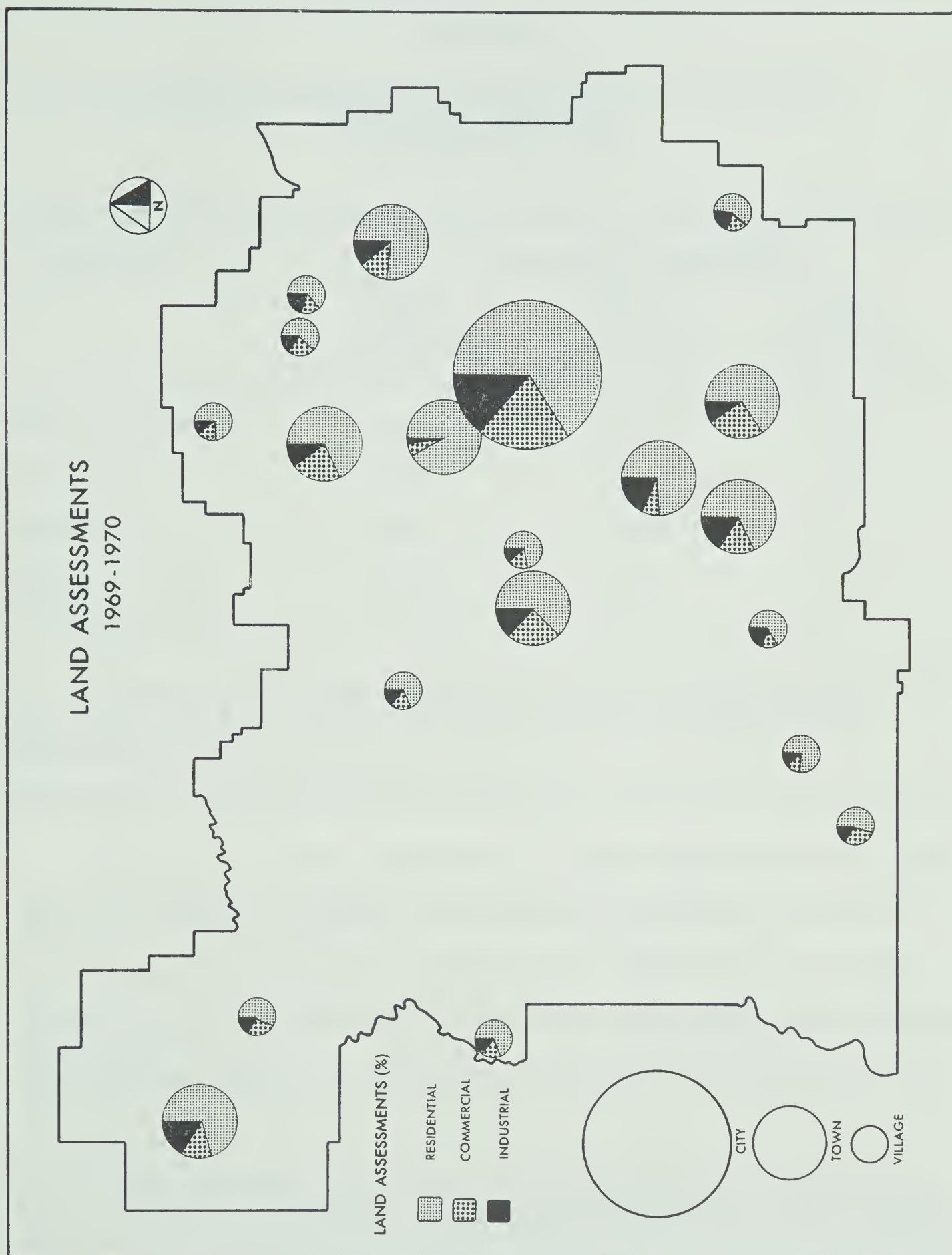


Figure 6.5

only 8.74 per cent of the total taxable land assessments (Figure 6.5).

TABLE 6.6

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL LAND ASSESSMENTS
PERCENTAGE COMPOSITION
BY SUBREGIONS, 1969

Subregion	<u>Percentage Composition</u>		
	Residential	Commercial	Industrial
	Land Assessments	Land Assessments	Land Assessments
City of Edmonton	67.83	21.48	10.69
Inner Ring	73.96	17.29	8.74
Outer Ring	64.96	20.82	14.22
Region	68.70	19.76	11.94

Source: The data were calculated from information obtained from the assessment forms at the Assessment Branch, The Department of Municipal Affairs.

Residential land is assessed at a higher market value than land used for industrial purposes. The spatial distribution of land-uses illustrates that residential activities are concentrated in the more centralized, built-up portions of the urban areas whereas most industrial land-uses are situated in peripheral locations.⁸ The market value of

⁸For a discussion of these land-use patterns, see for example: B. J. L. Berry, F. E. Horton, Geographic Perspectives on Urban Systems, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1970, pp. 440-483; H. J. Nelson, "The Form and Structure of Cities: Urban Growth Patterns", A Geography of Urban Places, eds. R. G. Putnam et al., Toronto, Methuen Publications, 1970, pp. 101-110.

land in the more intensely developed areas is substantially greater than the value of land situated in less centralized locations.

Equalized Land Values Per Acre

Land values can also be studied by comparing the equalized land assessments per acre. Some researchers may object to the use of assessed land values rather than actual market prices. An apt rebuttal is provided by R. E. Murphy:

"The fact that the assessed value is only a percentage of the real value does not matter a great deal to a geographer since he is more interested in the differential patterns than in absolute values."⁹

Table 6.7 lists the equalized land values per acre for the three subregions. The City of Edmonton has substantially higher equalized land values per acre than the remaining subregions. The availability of cheaper land in suburban areas may provide an incentive for the decentralization of activities.¹⁰ Lower land costs have been a major factor in the rapid residential growth which has occurred in the communities surrounding the City of Edmonton.¹¹

⁹R. E. Murphy, The American City, An Urban Geography, New York, McGraw-Hill Book Co., 1965, p. 202.

¹⁰For a discussion of urban decentralization see: C. C. Colby, "Centrifugal and Centripetal Forces in Urban Geography", Readings in Urban Geography, eds. H. M. Mayer and C. F. Kohn, Chicago, University of Chicago Press, 1959, pp. 287-298; R. E. Dickinson, The City Regions in Western Europe, London, Routledge and Regan Paul Ltd., 1962, p. 60; L. F. Schnore, "The Growth of Metropolitan Suburbs", American Sociological Review, September, 1957, pp. 175-182; E. N. Thomas, "Areal Association Between Population Growth and Selected Factors in the Chicago Urbanized Area", Economic Geography, No. 36, p. 158.

¹¹See M. Hassbring, A Satellite Community Study for the Edmonton and Calgary Areas, The Alberta Housing and Urban Renewal Corporation, October, 1969, pp. 10-13.

TABLE 6.7

EQUALIZED LAND VALUES PER ACRE
BY SUBREGIONS, 1969-1970

Subregion	Equalized Land Values Per Acre (Dollars)
City of Edmonton	\$ 3,544.78
Inner Ring	550.13
Outer Ring	273.08
Region	533.63

Source: The figures were calculated from equalized assessment data obtained from R. L. Cross, Secretary-Member, The Assessment Equalization Board. The 1969 total acreage for each municipality were listed in: Alberta, The Department of Municipal Affairs, 1969 Financial Statements.

Property Tax Levels and Land Assessments

A summary of the coefficients of correlation between the property tax levels and the land assessments is listed in Table 6.8. The positive correlation coefficient between the property tax per capita and the percentage of residential land assessments shows an average tendency for municipalities with higher residential land assessments to be characterized by higher property taxes per capita (Figure 6.6). A negative association is shown between the property tax per capita and the percentage of commercial and industrial assessments, although the relationships are relatively insignificant. Similar associations are shown between the effective tax rate and the assessment data.

A positive association is shown between the property tax per capita and the equalized land assessments per acre; a negative association is shown between the effective tax rate and the equalized land assessments per acre. Although neither relationship is very significant, it may be hypothesized that higher property taxes per capita and lower effective tax rates are generally characteristic of municipalities having higher land assessments per acre.

TABLE 6.8

 COEFFICIENTS OF CORRELATION
 PROPERTY TAX LEVELS AND
 LAND ASSESSMENTS

Land Assessment Indices	Coefficients of Correlation	
	PTC	ETR
Percentage of Residential Land Assessments	.448	.339
Percentage of Commercial Land Assessments	-.388	-.249
Percentage of Industrial Land Assessments	-.280	-.269
Equalized Land Assessment Per Acre	.261	-.222

REGRESSION LINE FOR PROPERTY TAX PER CAPITA AGAINST
PROPORTION OF RESIDENTIAL LAND ASSESSMENTS

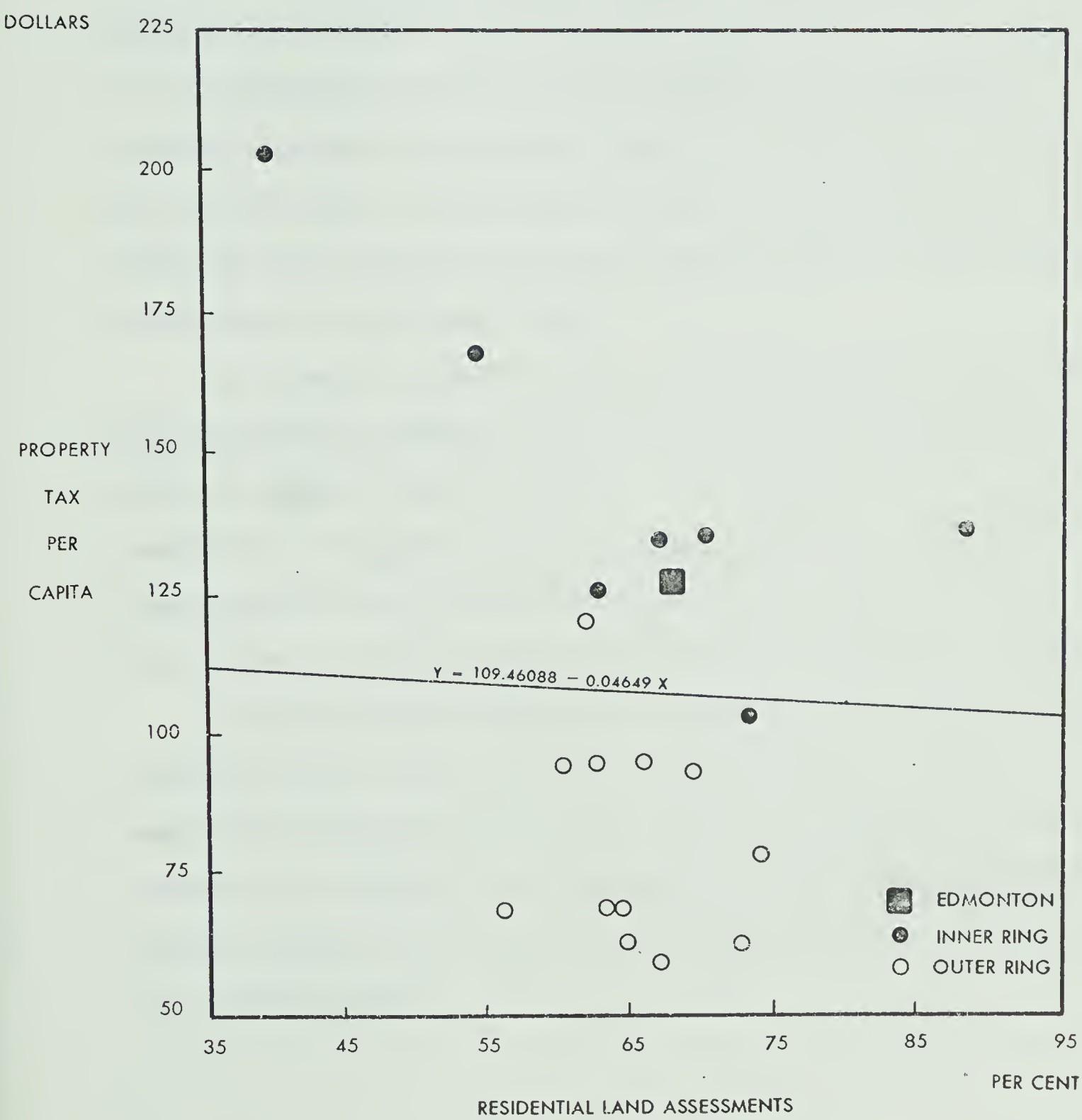


Figure 6.6

CONCLUSION

The primary objective of this chapter was to study the relationship between the property tax levels and the land-use patterns. It was shown that the property tax per capita varies directly with the proportion of industrial land-use and the residential land assessments. A negative association was recorded between the property tax per capita and the proportion of residential land-use. It was hypothesized that higher property taxes per capita are generally found in municipalities having higher average land values.

In summary, communities having high proportions of their land-use allocated for industrial purposes are generally characterized by increased property taxes per capita. The municipalities with a high proportion of residential land-use, most of which are in the outer ring subregion, are taxed substantially less on a per capita basis. This pattern is largely determined by Alberta's equalization programs.

No statistically significant correlations were obtained between the effective tax rates and the land classifications. However, it does appear that the effective tax rate is positively associated with the proportion of residential land assessments and negatively associated with the commercial and industrial assessments, along with the equalized land values per acre.

Chapter VII

A PREDICTIVE MODEL FOR PROPERTY TAX LEVELS

One of the main objectives of this study was to examine certain variables in order to explain the variation in property tax levels among the urban municipalities in the Edmonton Region Planning District. The preceding chapters compared property tax levels with selected community characteristics based on simple correlation analysis. A number of these relationships warrant further study. This chapter employs a multiple regression (stepwise, in order of explanatory significance) of the tax levels on the predictor variables.

MULTIPLE REGRESSION AND CORRELATION

The correlation coefficients listed in the previous chapters are capable of showing the direction and significance of the variation in one variable in relation to another. Multiple correlation summarizes the combined influence of a number of independent variables on a designated dependent variable.

The amount of influence each variable has on the property tax level can be determined by multiple regression analysis.¹ The square

¹Multiple regression analysis is based on the formula:
$$Y = a + b_1X_1 + b_2X_2 + \dots + b_nX_n$$
 where:

of the coefficient of multiple correlation (R^2) is defined as the coefficient of multiple determination; it is interpreted as the percentage of the variation in a dependent variable that can be explained by variations in the independent variables.² Multiple regression is essentially a technique for prediction.

In this study, the relationships between the property tax levels and the independent variables are determined by using a step-wise multiple regression program. At each step, the variable which provides the biggest improvement in the "goodness of fit" is added to the equation until all variables which give a specified degree of improvement have been added.

Selection of the Independent Variables

The selection of the independent variables in the multiple regression analyses is made by including only those variables whose correlation values with the property tax levels are significantly different from zero at the five per cent probability level.³ With twenty pairs of values of

Y = dependent variable

X = independent variable

a = constant

b = amount of change in an independent variable controlling
for the effect of all others

²For a discussion of multiple regression analysis, see: F. E. Croxton et. al., Applied General Statistics, Englewood Cliffs, Prentice-Hall, Inc., 1967, Ch. 21; M. Ezekiel and K. A. Fox, Methods of Correlation and Regression Analysis, New York, John Wiley and Sons, Inc., 1930, pp. 151-203; S. Gregory, Statistical Methods and the Geographer, London, Longman Group Limited, 1963, pp. 207-238.

³"... in the social sciences, it is usual to use the five per cent significance level for tests of significance." F. Conway, Sam-

the variables, the correlation value has to be at least 0.44 in order to be significantly different from zero at the 5 per cent probability level.⁴

Tests of Significance

Several tests are used to determine the statistical significance of the relationships indicated by the regression equations. The Student's "t" test can be used for this purpose, the "t" value being calculated by the formula:⁵

$$t = \frac{\text{Regression Coefficient}}{\sqrt{\frac{\text{Sum of the squares of the independent variable}}{\text{Standard error of the estimate of the dependent variable}}}}$$

The Student's "t" distribution is used in small sample surveys; the difference between the normal distribution and the Student's distribution may be "disregarded as negligible if the number of samples is less than 30".⁶

The regression coefficient, which expresses the degree of slope of the regression line, is an estimate of the regression line based on the total population. Another sample of that same population

pling--An Introduction for Social Scientists, London, George Allen and Unwin, Ltd., 1967, p. 85.

⁴There are only 5 chances in 100 that a value of r as large as +0.44 or as small as -0.44 will occur by pure chance in drawing a random sample of 20 units from the universe.

⁵S. Gregory, op. cit., p. 217.

⁶A. L. O'Toole, Elementary Practical Statistics, New York, The MacMillan Co., 1964, p. 218.

is likely to yield a somewhat different estimate of the true regression coefficient. Gregory states, "it is therefore desirable to obtain the standard error of any regression coefficient that is calculated from the available sample as this will allow both an assessment of its statistical significance to be made and also an estimate of the range within which the true regression coefficient is likely to lie".⁷ This is obtained as follows:

$$\text{S.E. regression coefficient} = \frac{\text{S.E. of the estimate of the dependent variable}}{\sqrt{\text{standard deviation of the independent variable } x}}$$

$$\sqrt{\frac{\text{no. of items}}{}}$$

The coefficients of regression (b) represent the amount of change in one of the independent variables, controlling for the effect of all others. Since the independent variables are expressed in different units and have different standard deviations, it is not possible to determine the relative importance of these variables by comparing their regression coefficients. The standardized regression coefficients (betas), shown in the last column of Table 7.4, are designed to permit such a comparison.

The standardized regression coefficients (betas) are formed by stating each of the variables in units of its own individual standard deviation or by formula:

$$B_{yx} = b_{yx} \frac{(S_x)}{S_y}$$

where:

⁷ S. Gregory, op. cit., p. 220.

- B_{yx} = beta coefficient for y and x
 b_{yx} = regression coefficient for y and x
 S_x = standard deviation of x
 S_y = standard deviation of y⁸

Property Tax Per Capita

The relationships between the property tax per capita and the selected independent variables are listed in Table 7.1. This matrix lists the coefficients of correlation which are significant at the five per cent probability level.

A problem of multicollinearity arises if two or more closely correlated variables are included in the analysis whereby the relative importance of the variables becomes unreliable. It is shown in Table 7.1 that many of the independent variables are closely associated with each other. Two separate analyses are conducted to counteract this problem.⁹ The property tax per capita is examined by the following categories:

1. Assessment and Fiscal Variables
2. Population, Socio-Economic, and Land-Use Variables

1) Assessment and Fiscal Variables.¹⁰ Six of the selected variables

⁸M. Ezekiel, K. A. Fox, op. cit., p. 148.

⁹Preliminary analyses indicated that the results of the stepwise regression would be unreliable if all the variables were combined into one equation since a high degree of interrelationship existed among these variables.

¹⁰The equalized property tax base per resident is omitted from the analysis although it is closely associated with the property tax per capita ($r = .930$). The results of the stepwise regression would be

TABLE 7.1

CORRELATION COEFFICIENTS
SIGNIFICANT AT THE FIVE PER CENT
PROBABILITY LEVEL
PROPERTY TAX PER CAPITA AND SELECTED VARIABLES

	PTC	RSR	% Ind. Assessment	Imp. Per Built- Upon Acre	Exp. Per Capita	% Property Tax of Total Revenue
PTC	1.000	.930	.622	.631	.814	.695
RSR	.930	1.000	.757	.767	.805	.587
% Ind. Assessment	.622	.757	1.000	.503	--	--
Imp./Built-Upon Acre	.631	.767	.503	1.000	.696	--
Exp./Capita	.814	.805	--	.696	1.000	--
% Property Tax of Revenue		.695	.587	--	--	1.000
Fixed Assets/Capita		.606	.449	--	--	.443
Debt Per Capita		.492	--	.532	--	--
% 15-65 years		.519	.619	.551	.571	--
Average Male Earnings		.790	.786	.612	.615	.516
% Second Occupations		.525	.614	.467	--	.461
% Grade 8 or Higher		.441	.577	.628	.730	--
% Ind. Land-Use		.695	.635	.695	--	.645

TABLE 7.1--CONTINUED

	Fixed Assets Per Capita	Debt Per Capita	% 15 - 65 Years of Age	Average Male Earnings	% Second Occupations	% Grade 8 or Higher	% Ind. Land-Use
PTC	.606	.492	.519	.790	.525	.441	.695
RR	.449	--	.619	.786	.614	.577	.635
% Ind. Assessment	--	--	.551	.612	.467	.628	.695
Imp./Built-Upon Acre	--	.532	.571	.615	--	.730	--
Exp./Capita	--	--	.566	.517	.462	--	--
% Property Tax of Revenue	.443	--	--	.656	--	--	.645
Fixed Assets/Capita	1.000	.604	--	.543	--	--	.595
Debt Per Capita	.604	1.000	--	.543	--	.517	.531
% 15 - 65 years	--	--	1.000	.502	.505	.480	.485
Average Male Earnings	.543	.543	.502	1.000	--	.489	.672
% Second Occupations	--	--	.505	--	1.000	--	--
% Grade 8 or Higher	--	.517	.480	.489	--	1.000	--
% Ind. Land-Use	.595	.531	.485	.672	--	--	1.000

are classified as either assessment or fiscal indices. These include the municipal expenditures per capita (X_1), real property tax as a percentage of municipal revenue (X_2), fixed assets per capita (X_3), general debt per capita (X_4), percentage of industrial assessments (X_5), and value of equalized improvements per built-upon acre (X_6). Table 7.2 provides a summary of the range in values, the arithmetic mean and the standard deviation of these variables.

The coefficients of multiple determination listed in Table 7.3 reveal that approximately 98.4 per cent ($R^2 = .98385$) of the variation in the property tax per capita is explained by the predictor variables.¹¹ The current expenditures per capita (X_1) is clearly the most important variable, accounting for more than 66 per cent of the variation in the value of property taxes per capita in the equation.

It is also shown that the real property tax as a percentage of total current revenue (X_2) is an important determinant of the property tax level ($R^2 = .28599$). The fixed assets per capita (X_3) and the proportion of industrial assessments (X_5) are the next most powerful predictor variables introduced into the regression equation. The equalized improvements per built-upon acre (X_6) and the general debt (municipality's share) per capita (X_4) provide almost negligible explanations for the variation in property taxes per capita.

distorted if the property tax base per resident were included in the analysis since many of the variables are as closely related to this variable as they are to the property tax per capita. This relationship is attributable to the equalization programs in Alberta.

¹¹The coefficient of multiple determination (R^2) is the square of the coefficient of multiple correlation.

TABLE 7.2

 PROPERTY TAX PER CAPITA
 DESCRIPTIVE MEASURES
 ASSESSMENT--FISCAL VARIABLES

Variable	Range	Mean	Standard Deviation
Property Tax Per Capita (Dollars) (Y)	142.03	104.86	38.26
Current Expenditures Per Capita (Dollars) (X_1)	177.34	182.87	48.79
Percentage Real Property Tax of Total Revenue (X_2)	30.64	55.05	9.33
Fixed Assets Per Capita (Dollars) (X_3)	751.31	427.40	157.76
General Debit (Municipality's Share) Per Capita (Dollars) (X_4)	332.50	103.11	92.10
Proportion of Industrial Assessments (X_5)	51.43	14.38	11.74
Equalized Improvements Per Built- Upon Acre (Dollars) (X_6)	22,626.10	10,988.90	5,905.27

Table 7.4 provides a summary of the original and standardized regression coefficients. All three measures indicate that the coefficients for the current expenditures per capita and the real property taxes as a percentage of current revenue are highly significant. Their regression coefficients are more than ten times as large as their

TABLE 7.3

MULTIPLE CORRELATION OF PROPERTY TAX
 PER CAPITA AND ASSESSMENT--FISCAL
 VARIABLES

Step	Independent Variable	Coefficient of Regression (b)	R ²
1	Current Expenditures Per Capita (X_1)	.46922	.662
2	Percentage Real Property Tax of Total Revenue (X_2)	1.81444	.948
3	Fixed Assets Per Capita (X_3)	.03624	.969
4	Proportion of Industrial Assessments (X_5)	.43432	.983
5	Equalized Improvements Per Built-Upon Acre (X_6)	.00018	.984
6	General Debt (Municipality's Share) Per Capita (X_4)	-.00157	.984

$$Y \text{ intercept} = -104.43$$

standard errors; their "t" values are also very significant.¹² The relative importance of the remaining variables in influencing property taxes per capita is substantially smaller.

¹²With 13 degrees of freedom, the minimum significant value of "t" with 99 per cent confidence limits is 3.012. The "t" values of 11.549 (X_1) and 10.768 (X_2) are well above this limit. The minimum significant value with 95 per cent confidence limits is 2.160.

TABLE 7.4

 ORIGINAL AND STANDARDIZED
 REGRESSION COEFFICIENTS
 ASSESSMENT--FISCAL VARIABLES

Step	Independent Variable	Regression Coefficient	Standard Regression Coefficient	"t" Value	Standardized Regression Coefficient
1	X_1	.46922	.04063	11.549	0.59827
2	X_2	1.81444	.16851	10.768	0.44253
3	X_3	.03624	.01309	2.769	0.14927
4	X_5	.43432	.15169	2.863	0.13324
5	X_6	.00018	.00041	0.451	0.15435
6	X_4	-.00157	.02257	-0.069	0.03852

2) Population, Socio-Economic, and Land-Use Variables. Five different independent variables are listed under this heading: percentage 15-65 years of age (X_1), average annual male earnings (X_2), percentage of secondary occupations (X_3), percentage of industrial land-use (X_4), and the percentage of Grade 8 education or higher (X_5). Table 7.5 lists the descriptive measures for these variables.

Approximately 72.9 per cent ($R^2 = .72926$) of the variation in property taxes per capita is explained by the predictor variables in this equation. The average annual male earnings (X_2) accounts for more than 62 per cent of the variation. The percentage of secondary occupations (X_3) and the percentage of industrial land (X_4) follow in order of

TABLE 7.5
PROPERTY TAX PER CAPITA
DESCRIPTIVE MEASURES
POPULATION, SOCIO-ECONOMIC AND LAND-USE VARIABLES

Variable	Range	Mean	Standard Deviation
Property Tax Per Capita (Dollars) (Y)	142.03	104.86	38.26
Percentage 15-65 Years of Age (X_1)	17.71	55.11	4.15
Average Annual Male Earnings (Dollars) (X_2)	1,696.00	3,065.65	457.20
Percentage of Secondary Occupations (X_3)	40.43	16.01	9.57
Percentage of Industrial Land-use (X_4)	58.56	21.37	14.18
Percentage Grade 8 or Higher (X_5)	36.95	42.87	10.62

importance.

The results of the significance tests are listed in Table 7.7. They show that these variables are less significant in explaining variations in the property tax per capita than the assessment-fiscal variables. The only variable which is very significant is the average annual male earnings. The standard error of the regression coefficient is approximately three times the value of the regression coefficient. The "t" value (2.746) is not quite significant with a 99 per cent confidence limit. With fourteen degrees of freedom, the minimum

TABLE 7.6

MULTIPLE CORRELATION OF PROPERTY TAX
 PER CAPITA AND POPULATION, SOCIO-ECONOMIC
 AND LAND-USE VARIABLES

Step	Independent Variable	Coefficient of Regression (b)	R ²
1	Average Annual Male Earnings (X ₂)	.04622	.623
2	Percentage of Secondary Occupations (X ₃)	1.02992	.703
3	Percentage Industrial Land (X ₄)	.59226	.728
4	Percentage Grade 8 or Higher (X ₅)	.04797	.729
5	Percentage 15-65 Years of Age (X ₁)	-.00848	.729

Y intercept = -67.57

TABLE 7.7

ORIGINAL AND STANDARDIZED
REGRESSION COEFFICIENTS
POPULATION, SOCIO-ECONOMIC, AND LAND-USE VARIABLES

Step	Independent Variable	Regression Coefficient	Standard Error Regression Coefficient	"t" Value	Standardized Regression Coefficient
1	X_2	.04622	.01683	2.746	0.55228
2	X_3	1.02992	.65627	1.569	0.25748
3	X_4	.59226	.52912	1.119	0.21914
4	X_5	.04797	.60574	0.079	0.12288
5	X_1	-.00848	1.71662	0.005	0.09158

significant "t" value with 99 per cent confidence limits is 2.977; with 95 per cent confidence limits, the value is 2.145.

Effective Tax Rate

Table 7.8 lists the correlation coefficients for the effective tax rate and the selected independent variables: fixed assets per \$1,000 of equalized assessments (X_1), current expenditures per \$1,000 of equalized assessments (X_2), percentage of commercial-industrial assessments (X_3), and the equalized improvements per built-upon acre (X_4). With the exception of the relationship between current expenditures and fixed assets, very few close associations exist among the independent variables. Table 7.9 lists several descriptive measures of these variables.

The coefficients of multiple determination listed in Table 7.10 indicate that only 42.9 per cent ($R^2 = .42956$) of the variation in the effective tax rates are accounted for by the predictor variables. The two fiscal indices provide the biggest explanation in the variation in effective tax rates.

The relatively low explanatory value of the regression equation is explained by the results of the significance tests listed in Table 7.11. The regression coefficients are almost the same as their standard errors, indicating that the relationships are of little significance. Similar findings are shown by the "t" values and the standardized regression coefficients. With fifteen degrees of freedom, the minimum significant value of "t" with 99 per cent confidence limits is 2.947; the minimum significant value with 95 per cent confidence limits is

TABLE 7.8

CORRELATION COEFFICIENTS
 SIGNIFICANT AT THE FIVE PER CENT
 PROBABILITY LEVEL
 EFFECTIVE TAX RATE AND SELECTED VARIABLES

	ETR	% Commercial-Industrial Assessment	Imp. Per Built-Upon Acre	Exp. Per \$1,000 of Equalized Assessments	Fixed Assets Per \$1,000 of Equalized Assessments
ETR	1.000	-.466	-.477	.556	.483
% Commercial-Industrial Assessments	-.466	1.000	--	--	--
Imp. Per Built-Upon Acre	-.477	--	1.000	-.590	-.560
Exp. Per \$1,000 of Equalized Assessments	.556	--	-.590	1.000	.938
Fixed Assets Per \$1,000 of Equalized Assessments	.483	--	-.560	.938	1.000

TABLE 7.9

EFFECTIVE TAX RATE
 DESCRIPTIVE MEASURES
 OF THE VARIABLES

Variable	Range	Mean	Standard Deviation
Effective Tax Rate (Per Cent) (Y)	3.91	7.66	1.01
Fixed Assets Per \$1,000 of Equalized Assessments (Dollars) (X_1)	366.59	323.34	84.47
Current Expenditures Per \$1,000 of Equalized Assessments (Dollars) (X_2)	109.55	140.98	27.83
Proportion of Commercial-Industrial Assessments (Per Cent) (X_3)	53.55	31.35	10.55
Equalized Improvements Per Built- Upon Acre (Dollars) (X_4)	22,626.10	10,988.90	5,905.27

TABLE 7.10
MULTIPLE CORRELATION OF EFFECTIVE
TAX RATE AND PREDICTOR VARIABLES

Step	Independent Variable	Coefficients Of Regression (b)	R ²
1	Fixed Assets Per \$1,000 of Equalized Assessments (X_1)	.00298	.233
2	Proportion of Commercial- Industrial Assessments (X_3)	-.02668	.352
3	Current Expenditures Per \$1,000 of Equalized Assessments (X_2)	.00873	.416
4	Equalized Improvements Per Built-Upon Acre (X_4)	.0003	.429
Y intercept - 6.57			

TABLE 7.11
ORIGINAL AND STANDARDIZED
REGRESSION COEFFICIENTS
EFFECTIVE TAX RATE

Step	Independent	Regression	Standard Error Regression Coefficient	"t" Value	Standardized Regression Coefficient
1	X_1	.00298	.00285	1.043	0.24923
2	X_3	-.02668	.02029	-1.315	0.24085
3	X_2	.00873	.00802	1.089	-0.27869
4	X_4	-.00003	.00004	-0.573	-0.17540

2.131. The "t" values of the regression equation are well below these limits.

CONCLUSION

The use of a multiple regression (stepwise, in order of explanatory significance) of the tax levels on the predictor variables has resulted in several significant findings. A large amount of the variation in property taxes per capita was explained by the predictor variables. The most important of these independent variables were: the equalized tax base per resident, the municipal expenditures per capita, the real property tax as a percentage of total current revenue, the fixed assets per capita, and the average annual male earnings.

The regression equation for the effective tax rate and the predictor variables was substantially less significant. A major problem of this analysis was that a large amount of scatter, as indicated by the standard deviations in Table 7.9, was shown for these variables. The standard errors in relation to the regression coefficients were also extremely high.

Chapter 8

SUMMARY AND CONCLUSIONS

This thesis has examined the property tax structure of the urban municipalities in the Edmonton Regional Planning District. The main reason for employing a geographic approach in studying property taxation and urban development was to illustrate the inequalities in property tax levels within the study area. Subsequent analyses revealed that the variations in property tax levels were associated with distinct community variables.

A review of the literature on property taxation and urban development presented in the introduction indicated that previous studies had dealt with several important issues. These topics included the property tax structure in the central city vs. the suburban communities; the relationship between property tax levels and the distribution and composition of taxable property; and the community characteristics which were associated with property taxation. A comparison of the literature and the results obtained in the current study yields several important observations.

CENTRAL CITIES VS. SUBURBAN COMMUNITIES

Previous studies have generally shown that the property tax levels are highest in the central cities as a result of increased public expend-

iture needs. The urban municipalities in the study area were listed in three categories--the City of Edmonton, an inner ring of municipalities, and an outer ring of municipalities. The study indicated that the inner ring, rather than the City of Edmonton, had the highest property tax levels. Two factors may be cited for these developments:

1. The City of Edmonton is a relatively recent urban centre and is characterized by only a limited proportion of deteriorated public facilities in need of replacement or major renovation.
2. The rapid growth of the inner ring municipalities in recent times has forced these centres to provide costly public facilities.

PROPERTY TAX PER CAPITA COMPARED TO THE EFFECTIVE PROPERTY TAX RATE

Most of the previous studies have used property tax rates which are comparable to the effective tax rates used in the current study. The property tax per capita generally displays an inverse relationship with the property tax rates.

The importance of the tax-sharing programs in the Province of Alberta must be stressed for a study of this nature. In 1969, 28 mills were levied against a municipality's equalized assessments under the School Foundation Program with an additional 4 mills levied under the Hospital Benefits Program. In some cases, more than 50 per cent of a municipality's tax requirements were levied under these provincial tax-sharing programs which created a higher property tax per capita for the

more affluent, tax-rich municipalities.¹

FACTORS ASSOCIATED WITH PROPERTY TAX LEVELS

Distribution and Composition of Taxable Property

The relationship between the distribution and composition of taxable property and property tax levels in the Edmonton area was similar to the results obtained in previous studies. A heavy concentration of industrial and commercial properties provided a larger tax base than residential land-uses. This generally resulted in a lowering of the property tax rates. The property tax levels in balanced or dormitory urban centres were less predictable.²

Two distinct municipalities are located in the Edmonton Regional Planning District which illustrate this relationship. The Town of Fort Saskatchewan which contains a large proportion of industrial assessments, had an effective tax rate of 6.02 per cent in 1969; the Town of St. Albert is almost an exclusively residential, dormitory community of the City of Edmonton and had an effective tax rate of 9.23 per cent. It was also shown that Fort Saskatchewan has the lowest effective tax rate, along with the highest property tax per capita for all the municipalities examined in the present study.

The relationship between property tax levels and the composition of the tax base was illustrated in Chapter II. The main conclusion was

¹See Chapter I, "Equalized Property Tax Base Per Resident".

²Refer to the review of the literature--"Distribution of Taxable Property".

that a positive association exists between the property tax per capita and the proportion of industrial property assessments. A negative relationship was shown between the effective tax rate and the concentration of commercial-industrial properties. Communities with increased proportions of commercial and industrial assessments were generally characterized by higher property taxes per capita and lower effective tax rates.

Density of Property Assessments

A comparison between the property tax levels and the value of equalized improvements per built-upon acre was also listed in Chapter II. It was shown that a fairly significant, positive association exists between the property tax per capita and this property density measure. A negative relationship was indicated between the effective tax rate and the value of equalized improvements per built-upon acre. In summary, municipalities characterized by greater densities of property assessments usually had higher property taxes per capita and lower effective tax rates.

Municipal Fiscal Patterns

Comparisons between the property tax levels and several indices of municipal fiscal patterns were listed in Chapter III. The property tax per capita was positively associated with the current expenditures per capita, the real property tax as a proportion of current revenues, and the value of fixed assets per capita. The effective tax rate was directly related with the value of municipal expenditures and fixed assets per \$1,000 of equalized assessments. A comparison between the

property tax per capita and the proportion of municipal revenue composed of grants, contributions, and subsidies indicated that municipalities having higher property taxes per capita usually receive a smaller proportion of their current revenue from provincial grants.

Population Indices

A correlation analysis comparing the 1960-1970 population growth with the property tax levels indicated that little association existed with either tax measure. Subsequent studies showed that both the property tax per capita and the effective tax rate displayed a positive correlation with the supplementary school requisitions. The municipalities which had experienced the most rapid population growths were characterized by increased property tax levels. The results also indicated that these municipalities generally allocated smaller amounts of their property tax revenue for municipal purposes.

Comparison of the property tax levels and the populations by age-distributions generally indicated that municipalities having high property taxes per capita usually had a high proportion of their populations between the ages of 15 and 65. Municipalities with high effective tax rates were characterized by increased proportions of dependent populations. Little association was shown between the population density and the property tax levels.

Socio-Economic Indices

The property tax per capita was also positively associated with average income levels, the percentage of the labour force employed in manufacturing and construction activities, and the amount of educational

attainment. No significant correlations were found between the effective tax rate and the selected socio-economic indices.

Land-Use Indices

The relationship between property tax levels and land-use patterns was examined in Chapter VI. It was shown that municipalities with increased proportions of industrial land-use generally had higher property taxes per capita. These results were similar to those obtained when the property tax per capita was compared with the importance of industrial assessments. Little association was found between the effective tax rate and the land-use patterns.

PROPERTY TAX LEVELS AND COMMUNITY VARIABLES

A basic objective of the study was to determine which community variables were associated with determining property tax levels. The eventual goal was to delimit the factors, in order of significance, which could offer the best explanation for the variations in the levels of property taxation by incorporating a stepwise, multiple regression in the analyses.

Property Tax Per Capita

A high level of explanation for the property tax per capita was obtained with the predictor variables. The most important of these variables include the property tax base per resident, the municipal expenditures per capita, the real property tax as a percentage of total current revenue, the fixed assets per capita, average incomes, and proportion of industrial assessments. All of these variables show a pos-

itive, direct relationship with the property tax per capita.

Effective Property Tax Rate

The variations in the effective tax rate could not be adequately explained by studying the predictor variables. The effective tax rate varied directly with the amount of fixed assets and current expenditures per \$1,000 of equalized assessments. A negative relationship was obtained between the effective tax rate and the proportion of commercial-industrial assessments, along with the equalized value of improvements per built-upon acre.

It is concluded that communities with higher effective tax rates are generally characterized by increased valuations of fixed capital assets. They usually also have increased proportions of current expenditures. Smaller proportions of commercial-industrial taxable property, along with a lower density of property values tend also to be found in the municipalities having higher property tax rates.

GENERAL CONCLUSION

This study has shown that the type of urban development in a municipality has a definite effect on local property tax requirements. Urban centres having high property taxes per capita are generally characterized by high proportions of industrial properties, increased property densities, higher municipal expenditures and fixed assets per capita, large portion of working-age populations, and generally higher socio-economic achievement. Communities with high effective tax rates

usually have smaller proportions of commercial-industrial assessments, low density of property values, and higher municipal expenditures and fixed assets.

High property taxes per capita are largely influenced by Alberta's tax equalization programs. The effective property tax rate is a more realistic measure of a municipality's actual property tax burden. The impact of property taxation on the growth of the urban centres in the Edmonton area could not be determined in the present study. Nevertheless, it is noted that the inner ring municipalities generally have substantially higher effective tax rates than either the City of Edmonton or the outer ring municipalities.³ It is anticipated that further increases in their tax rates will create a major deterrent to future development in these potential growth centres.

³The main exception is Fort Saskatchewan which has a low effective tax rate, primarily the result of its large industrial assessment base.

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APPENDIX

TABLE 1

THE REAL PROPERTY TAX LEVY
BY MUNICIPALITIES, 1964 AND 1969

Municipality	Real Property Tax Levy 1964 (Dollars)	Real Property Tax Levy 1969 (Dollars)
Edmonton	\$ 27,760,484.47	\$ 50,638,695.00
Calmar	53,297.22	50,195.56
Devon*	159,771.27	215,727.52
Fort Saskatchewan	547,762.80	1,011,338.33
Leduc	239,437.45	338,841.36
Mayerthorpe	50,895.60	89,862.48
Morinville	63,233.36	125,264.67
St. Albert	687,275.65	1,378,655.06
Stony Plain	127,898.88	197,197.00
Bon Accord	11,718.00	17,201.47
Breton	22,652.88	30,345.90
Entwistle	19,884.95	22,952.34
Gibbons	15,144.90	22,567.50
Legal	28,749.68	36,096.66
New Sarepta	15,375.53	18,308.95
Onoway	25,893.89	36,370.85
Sangudo	22,818.00	31,407.44
Spruce Grove	42,216.68	96,724.88
Thorsby	47,668.49	72,285.53
Warburg	24,152.59	34,107.00

* includes business tax and "other"

Source: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

TABLE 2

THE PROPERTY TAX PER CAPITA, THE EFFECTIVE
 PROPERTY TAX RATE, AND THE EQUALIZED
 PROPERTY TAX BASE PER RESIDENT,
 BY MUNICIPALITIES, 1964 AND 1969

Municipality	PTC		ETR		RSR	
	1964	1969	(Dollars)	(Per Cent)	1964	1969
Edmonton	79.49	123.48	5.12	6.64	1,553.44	1,858.43
Calmar	76.14	68.11	6.79	7.60	1,120.89	895.77
Devon	112.28	168.15	6.00	8.13	1,869.89	2,068.02
Fort Saskatchewan	145.45	203.86	4.85	6.02	2,994.33	3,385.86
Leduc	84.13	101.72	5.95	7.66	1,413.10	1,328.68
Mayerthorpe	76.77	92.83	5.30	7.88	1,448.47	1,178.20
Morinville	67.63	125.89	6.71	9.93	1,007.29	1,268.19
St. Albert	80.07	134.60	6.62	9.23	1,209.33	1,458.05
Stony Plain	87.42	134.70	5.96	8.18	1,465.98	1,646.05
Bon Accord	61.67	63.24	6.18	7.24	998.67	873.62
Breton	43.40	67.89	6.16	6.05	704.00	1,122.62
Entwistle	48.38	69.76	6.50	9.39	744.82	742.58
Gibbons	71.10	61.83	6.42	7.91	1,106.69	781.65
Legal	49.83	63.89	6.41	7.45	777.88	857.56
New Sarepta	74.28	95.36	6.64	7.49	1,118.13	1,273.17
Onoway	67.08	93.50	6.45	7.04	1,040.13	1,327.66
Sangudo	69.78	95.75	6.21	7.80	1,153.61	1,227.13
Spruce Grove	70.83	133.78	5.01	7.79	1,414.95	1,717.14
Thorsby	78.15	120.48	5.84	6.73	1,338.53	1,789.37
Warburg	68.62	78.41	6.40	7.01	1,113.48	1,118.30

Source: The calculations were made from data in: Alberta, The Department of Municipal Affairs, Annual Report, 1964 and Financial Statements, 1969.

TABLE 3

THE PROPERTY TAX PER CAPITA,
BY MUNICIPALITIES, 1964

Municipality	Popula- tion	Municipal (Dollars)	Supple- mentary School (Dollars)	School Foundation (Dollars)	Hospital (Dollars)
Edmonton	349,233	21.25	8.83	42.72	6.68
Calmar	700	31.94	8.97	29.14	6.09
Devon	1,423	35.58	11.47	48.62	16.62
Fort Saskatchewan	3,766	28.08	21.26	77.85	18.26
Leduc	2,846	28.40	11.30	36.74	7.68
Mayerthorpe	663	29.10	4.21	37.66	5.79
Morinville	935	37.34	--	26.19	4.10
St. Albert	8,583	32.06	11.65	31.44	4.92
Stony Plain	1,463	40.41	2.93	38.12	5.97
Bon Accord	190	19.37	10.26	25.96	6.08
Breton	522	16.14	5.63	18.30	3.32
Entwistle	411	24.50	1.49	19.37	3.03
Gibbons	213	24.22	11.37	28.77	6.74
Legal	577	18.44	8.00	20.23	3.17
New Sarepta	207	30.17	8.95	29.07	6.08
Onoway	386	33.14	3.02	26.76	4.16
Sangudo	327	32.83	3.26	29.20	4.49
Spruce Grove	596	25.46	2.83	36.79	5.76
Thorsby	610	25.51	10.71	34.80	7.12
Warburg	352	23.65	8.91	28.95	6.68

Source: Alberta, The Department of Municipal Affairs, Annual Report, 1964.

TABLE 4
THE PROPERTY TAX PER CAPITA,
BY MUNICIPALITIES, 1969

Municipality	Popula-tion	Municipal (Dollars)	Supple- mentary School (Dollars)	School Foundation (Dollars)	Hospital (Dollars)
Edmonton	410,105	31.61	32.16	52.03	7.65
Calmar	737	25.12	14.33	25.08	3.58
Devon	1,283	61.29	35.22	57.90	13.73
Fort Saskatchewan	4,961	48.70	46.40	94.80	13.95
Leduc	3,331	37.95	21.26	37.20	5.31
Mayerthorpe	968	40.71	14.42	32.99	4.71
Morinville	995	50.14	32.52	35.51	7.73
St. Albert	10,243	21.80	46.60	54.23	11.96
Stony Plain	1,464	54.37	24.95	46.09	9.28
Bon Accord	272	12.97	22.21	24.46	3.60
Breton	447	13.86	17.96	31.43	4.64
Entwistle	329	32.57	9.43	20.79	6.97
Gibbons	365	17.48	19.90	21.23	3.22
Legal	565	14.92	21.42	24.01	3.53
New Sarepta	192	34.24	20.37	35.65	5.09
Onoway	389	34.76	16.25	37.17	5.31
Sangudo	328	41.47	15.02	34.36	4.91
Spruce Grove	723	56.27	22.48	48.08	6.95
Thorsby	600	34.59	28.63	50.10	7.16
Warburg	435	24.54	17.90	31.33	4.62

Source: Alberta, The Department of Municipal Affairs, Financial Statements, 1969.

TABLE 5

THE EFFECTIVE PROPERTY TAX RATE,
BY MUNICIPALITIES, 1964

Municipality	Equalized Assessments (dollars)	Municipal (per cent)	School (per cent)	Hospital (per cent)
Edmonton	542,513,232	1.37	3.32	0.43
Calmar	784,622	2.85	3.40	0.54
Devon	2,660,860	1.90	3.21	0.89
Fort Saskatchewan	11,276,643	0.94	3.31	0.61
Leduc	4,021,675	2.01	3.40	0.54
Mayerthorpe	960,337	2.01	2.89	0.40
Morinville	941,814	3.71	2.60	0.41
St. Albert	10,379,691	2.65	3.56	0.41
Stony Plain	2,144,733	2.76	2.80	0.41
Bon Accord	189,747	1.94	3.63	0.61
Breton	367,500	2.29	3.40	0.47
Entwistle	306,120	2.60	2.80	0.41
Gibbons	235,725	2.19	3.63	0.61
Legal	448,834	2.37	3.53	0.41
New Sarepta	231,452	2.69	3.40	0.54
Onoway	401,488	3.19	2.86	0.40
Sangudo	367,232	2.92	2.89	0.40
Spruce Grove	843,308	1.80	2.80	0.41
Thorsby	816,504	1.91	3.40	0.53
Warburg	391,946	2.12	3.40	0.64

Source: Alberta, The Department of Municipal Affairs, Annual Report, 1964.

TABLE 6
THE EFFECTIVE PROPERTY TAX RATE,
BY MUNICIPALITIES, 1969

Municipality	Equalized Assessments (dollars)	Municipal (per cent)	School (per cent)	Hospital (per cent)
Edmonton	762,150,509	1.70	4.53	0.41
Calmar	660,186	2.80	4.40	0.40
Devon	2,653,268	2.96	4.50	0.66
Fort Saskatchewan	16,797,236	1.44	4.17	0.41
Leduc	4,425,817	2.86	4.40	0.40
Mayerthorpe	1,140,498	3.46	4.02	0.40
Morinville	1,261,854	3.95	5.36	0.61
St. Albert	14,934,773	1.50	6.92	0.82
Stony Plain	2,409,817	3.30	4.32	0.56
Bon Accord	237,625	1.48	5.34	0.41
Breton	501,812	1.23	4.40	0.41
Entwistle	244,309	4.39	4.07	0.94
Gibbons	285,303	2.24	5.26	0.41
Legal	484,519	1.74	5.30	0.41
New Sarepta	244,448	2.69	4.40	0.40
Onoway	516,460	2.62	4.02	0.40
Sangudo	402,499	3.38	4.02	0.40
Spruce Grove	1,241,495	3.28	4.11	0.40
Thorsby	1,073,620	1.93	4.40	0.40
Warburg	486,680	2.19	4.40	0.41

Source: Alberta, The Department of Municipal Affairs, Financial Statements, 1969.

TABLE 7
ASSESSED PROPERTY VALUATION,
BY MUNICIPALITIES, 1969

Municipality	Land (Dollars)	Buildings & Improvements (Dollars)	Power (Dollars)	Pipe (Dollars)
Edmonton	242,740,040	540,040,830	111,340	2,572,430
Calmar	77,650	603,970	13,080	10,970
Devon	244,060	2,384,230	41,120	169,250
Fort Saskatchewan	2,867,780	14,617,800	161,910	59,210
Leduc	1,102,810	3,954,540	45,060	22,170
Mayerthorpe	204,310	1,019,900	17,660	6,220
Morinville	383,080	966,650	15,360	8,880
St. Albert	5,095,080	11,951,400	99,060	76,970
Stony Plain	975,180	2,008,190	29,470	14,690
Bon Accord	22,990	234,490	3,440	3,170
Breton	64,480	402,380	7,550	3,820
Entwistle	29,070	199,510	7,720	28,080
Gibbons	47,716	332,894	6,150	2,640
Legal	38,050	466,670	7,440	4,560
New Sarepta	16,920	237,900	4,340	2,610
Onoway	65,540	486,590	11,710	3,740
Sangudo	19,785	377,840	7,680	3,640
Spruce Grove	535,190	1,133,770	10,900	7,550
Thorsby	141,000	983,340	13,000	6,320
Warburg	58,160	444,520	8,400	3,920

Source: Alberta, The Department of Municipal Affairs, Financial Statements, 1969.

TABLE 8

EQUALIZED ASSESSMENTS
BY MUNICIPALITIES, 1970

Municipality	Land Assessments (Dollars)	Building and Improvement Assessments (Dollars)
Edmonton	190,652,340	623,729,440
Calmar	100,028	640,257
Devon	178,524	2,574,593
Fort Saskatchewan	1,646,774	16,330,497
Leduc	893,568	3,886,201
Mayerthorpe	119,519	1,064,137
Morinville	265,370	1,003,565
St. Albert	3,062,820	12,061,657
Stony Plain	542,148	1,933,718
Bon Accord	41,235	233,160
Breton	49,364	457,586
Entwistle	16,099	236,848
Gibbons	41,334	296,560
Legal	30,364	470,521
New Sarepta	10,200	239,127
Onoway	42,917	564,704
Sangudo	16,508	413,508
Spruce Grove	333,411	1,058,615
Thorsby	120,164	984,720
Warburg	44,334	459,513

Source: Personal discussions with Mr. R. L. Cross, Secretary,
Member of the Assessment Equalization Board.

TABLE 9

SELECTED COMPONENTS OF CURRENT EXPENDITURES
BY MUNICIPALITIES, 1969

Municipality	Total Current Expenditures (Dollars)	Selected Components of Current Expenditures				
		Government Administrative (Dollars)	Protection (Dollars)	Public Works (Dollars)	Recreation and Community (Dollars)	Education (Dollars)
Edmonton	\$104,593,199.00	\$3,872,119.00	\$17,724,357.00	\$3,205,350.00	\$8,266,083.00	\$34,532,364.00
Calmar	102,638.92	8,657.44	7,201.11	15,093.89	2,360.35	29,047.98
Devon	241,494.60	30,329.21	14,102.70	20,426.87	10,833.64	119,475.00
Fort Saskatchewan	1,391,082.78	71,361.98	91,030.66	123,186.53	134,010.31	700,495.50
Leduc	619,760.80	36,936.90	55,657.77	42,970.58	58,975.62	194,736.07
Mayerthorpe	174,951.30	10,067.09	10,816.08	17,266.78	12,885.59	45,893.70
Morinville	199,504.19	21,422.55	6,645.74	12,360.78	3,959.00	67,689.28
St. Albert	1,919,273.66	163,940.71	173,421.86	86,619.21	117,913.85	1,032,819.56
Stony Plain	415,151.67	26,972.97	35,812.02	31,684.50	35,319.03	104,008.00
Bon Accord	34,927.33	2,944.71	1,554.50	2,699.83	50.00	12,694.50
Bretton	72,140.74	5,852.20	4,269.96	6,915.90	2,605.07	22,080.00
Entwistle	46,131.61	5,403.21	2,249.68	7,713.12	2,190.04	9,942.00
Gibbons	50,004.57	4,807.12	2,982.83	4,919.64	110.95	15,011.34
Legal	60,017.13	7,485.66	3,831.81	8,151.54	528.97	25,670.00
New Sarepta	30,151.55	2,901.70	2,193.57	1,114.29	100.00	10,756.17
Onoway	65,871.13	4,406.69	4,344.84	5,700.27	1,294.32	10,782.47
Sangudo	59,027.07	5,151.27	2,815.40	7,413.20	978.84	16,196.59
Spruce Grove	146,448.27	16,273.02	3,986.43	18,483.72	7,630.32	51,015.51

TABLE 9--CONTINUED

Municipality	Total Current Expenditures	Selected Components of Current Expenditures			
		Government Administrative (Dollars)	Protection (Dollars)	Public Works (Dollars)	Recreation and Community (Dollars)
Thorsby	137,615.93	5,120.50	4,977.72	14,067.74	753.10
Warburg	62,951.97	4,297.91	4,292.99	5,346.25	406.63

Source: Alberta, The Department of Municipal Affairs, "General Fund--1969 Expenditures", Financial Statements, 1969.

TABLE 10

**SELECTED COMPONENTS OF FIXED ASSETS
BY MUNICIPALITIES, 1969**

Municipality	Total Fixed Capital Assets (Dollars)	Selected Components of Fixed Capital Assets				
		General Government (Dollars)	Protection (Dollars)	Public Works (Dollars)	Sanitation & Waste Removal (Dollars)	Recreation (Dollars)
Edmonton *	\$154,213,711.00
Calmar	257,047.69	4,368.17	36,264.27	94,273.92	107,318.83	14,822.50
Devon	1,262,786.54	41,388.39	13,355.42	242,703.09	178,480.52	25,984.04
Fort Saskatchewan	1,836,825.76	56,603.42	88,150.17	525,081.67	339,195.77	795,670.10
Leduc	1,680,069.04	45,689.59	51,388.84	724,172.51	526,644.53	322,818.89
Mayerthorpe	450,029.09	7,942.38	15,761.09	221,982.12	108,742.82	62,432.74
Morinville	415,187.22	27,068.95	26,039.10	107,902.81	211,894.72	42,281.64
St. Albert	5,515,716.38	208,305.28	136,003.52	3,507,850.68	1,121,835.59	444,934.20
Stony Plain	731,574.64	1,738.99	69,071.01	217,396.78	151,405.05	291,512.81
Bon Accord	76,141.32	3,600.10	---	2,887.22	69,654.00	---
Bretton	156,074.26	21,278.85	6,497.32	63,469.35	45,552.39	8,421.35
Entwistle	99,979.10	20,014.50	10,592.76	21,878.63	43,009.57	4,483.64
Gibbons	85,027.41	998.50	16,130.95	29,659.54	36,678.22	1,560.20
Legal	151,849.91	43,153.79	6,711.06	58,339.37	38,386.65	3,983.54
New Sarepta	77,658.82	507.55	13,384.77	25,148.94	36,633.63	1,983.93
Onoway	147,063.63	3,912.80	15,306.34	16,548.23	94,879.80	16,416.46
Sangudo	147,101.31	1,123.96	8,751.08	56,289.53	55,619.23	20,817.51
Spruce Grove	239,453.07	25,484.66	22,334.91	53,363.70	73,948.90	64,093.40

TABLE 10--CONTINUED

Municipality	Total Fixed Capital Assets	Selected Components of Fixed Capital Assets			
		General Protection Government (Dollars)	Public Works (Dollars)	Sanitation & Waste Removal (Dollars)	Recreation (Dollars)
Thorsby	314,258.43	1,083.00	9,194.41	211,855.48	81,431.41
Warburg	198,568.51	15,912.89	14,021.12	37,429.41	77,395.94

*No breakdown available. This amount is also depreciated since the City of Edmonton reclassifies this as a debenture debt.

Source: Alberta, The Department of Municipal Affairs, "Fixed Assets" Financial Statements, 1969.

TABLE 11
ANALYSIS OF GENERAL UNMATURED DEBENTURE DEBT
BY MUNICIPALITIES, 1969

Municipality	Municipality's Share			Total (Dollars)
	Sewers (Dollars)	Sidewalks (Dollars)	Other (Dollars)	
Edmonton*	--	--	--	142,023,448.00
Calmar**	52,198.84	15,282.91	--	67,481.75
Devon	116,523.44	--	324,493.41	441,016.85
Fort Saskatchewan	78,919.26	--	488,502.87	567,422.13
Leduc	86,818.74	11,764.55	331,646.06	430,229.35
Mayerthorpe	30,057.98	--	56,234.83	86,292.81
Morinville	93,648.94	--	20,668.16	114,317.10
St. Albert	84,992.94	13,601.43	1,505,874.05	1,604,468.42
Stony Plain	33,809.20	11,960.00	126,696.50	172,465.70
Bon Accord	21,445.85	--	--	21,445.85
Breton	13,422.72	--	35,000.00	48,422.72
Entwistle	5,378.49	--	5,260.56	10,639.05
Gibbons	5,039.38	--	--	5,039.38
Legal	16,250.60	--	19,611.78	35,862.38
New Sarepta	12,913.40	--	--	12,913.40
Onoway	17,893.11	--	13,000.00	30,893.11
Sangudo	7,063.62	--	--	7,063.62
Spruce Grove	17,823.18	--	--	17,823.18

TABLE 11--CONTINUED

Municipality	Municipality's Share			Total (Dollars)
	Sewers (Dollars)	Sidewalks (Dollars)	Other (Dollars)	
Thorsby*	29,488.42	751.72	115,072.48	115,072.48
Warburg	8,033.57	--	--	8,033.57

* No breakdown available

** Includes property owners' share

Source: Alberta, The Department of Municipal Affairs, "Analysis of Gross Unmatured Debenture Debt", Financial Statements, 1969.

TABLE 12

POPULATION TRENDS
BY MUNICIPALITIES
1960, 1965, 1970, 1975, AND 1980

Municipality	Population Figures and Projection				
	1960	1965	1970	1975	1980
Edmonton	269,314	357,696	422,418	492,918	561,973
Calmar	730	700	771	817	869
Devon	1,512	1,423	1,398	1,356	1,318
Fort Saskatchewan	3,305	3,820	5,302	6,542	7,842
Leduc	2,429	2,857	3,779	4,578	5,408
Mayerthorpe	605	1,008	1,042	1,168	1,271
Morinville	957	935	1,251	1,483	1,736
St. Albert	3,190	9,070	10,530	13,095	15,384
Stony Plain	1,235	1,518	1,628	1,781	1,923
Bon Accord	127	190	314	423	561
Breton	566	522	447	380	336
Entwistle	422	411	329	265	196
Gibbons	157	226	492	709	917
Legal	457	582	565	584	594
New Sarepta	176	181	206	226	247
Onoway	268	377	473	572	670
Sangudo	339	325	369	399	430
Spruce Grove	398	610	1,110	1,583	1,984
Thorsby	492	636	608	623	627
Warburg	288	412	438	489	534

Source: Population Figures as established under the Municipalities Assistance Act, 1960, 1965, and 1970. Population Projections for 1975 and 1980 were obtained by using the formula as described in Chapter IV.

TABLE 13

LAND-USE
BY MUNICIPALITIES, 1969-1970

Municipality	Total Land Acreage	Land-Use Categories in Acres						Open Space
		Residen- tial	Commer- cial	Indus- trial	Institu- tional	Vacant	Utilities	
Edmonton*	31,100.00	10,000.00	1,600.00	2,800.00	N.A.	N.A.	24.00	16,700.00
Calmar	203.50	50.98	3.82	15.41	13.80	0.73	0.73	94.76
Devon	897.84	65.38	5.27	122.03	22.56	243.07	6.88	432.65
Fort Saskatchewan	2,814.09	180.34	24.74	189.29	215.49	351.70	8.31	1,844.22
Leduc	1,348.88	176.44	24.58	67.88	50.46	93.56	68.93	821.47
Mayerthorpe	249.29	51.82	6.53	22.94	26.79	15.71	0.29	125.21
Morinville	607.93	66.68	12.90	35.35	44.60	40.24	46.02	362.14
St. Albert	3,845.70	495.00	33.39	66.75	108.55	307.67	19.72	2,784.04
Stony Plain	1,195.00	84.00	24.96	19.38	35.38	130.11	0.22	900.95
Bon Accord**	201.80	--	--	--	--	--	--	--
Breton	267.50	20.00	3.27	4.07	19.07	10.86	0.88	209.35
Entwistle	385.00	22.61	6.02	2.50	30.35	37.07	0.99	285.46
Gibbons	240.00	16.96	3.16	2.90	9.91	8.15	2.79	196.13
Legal	242.88	31.33	3.15	7.70	21.45	50.34	12.53	116.38
New Sarepta	113.00	13.76	3.60	4.18	14.50	13.62	0.25	63.09
Onoway	75.88	34.72	3.85	5.65	9.06	6.17	0.73	15.70
Sangudo	247.00	16.80	5.21	3.49	14.06	13.62	0.26	193.56
Spruce Grove	464.38	71.16	15.88	46.57	24.50	129.72	0.13	176.42
Thorsby	212.13	33.91	6.97	4.77	22.24	15.37	0.55	128.32
Warburg	153.46	40.20	3.30	2.39	14.07	7.00	0.15	86.35
Sherwood Park***	1,702.59	618.93	6.49	22.12	70.36	531.42	0.68	452.59

* 1961 data--complete breakdown not available

** 1969 data--no breakdown available

*** unincorporated municipality situated near the City of Edmonton

Source: The information was obtained from the Provincial Planning Branch and the Edmonton Regional Planning Commission.

TABLE 14

 RESIDENTIAL, COMMERCIAL AND INDUSTRIAL AREA
 PER POPULATION-ASSESSMENT BASE
 BY MUNICIPALITIES, 1969-1970

Municipality	Land-Use Per 100 Residents			Land-Use Per \$100,000 Equalized Assessments		
	Residen- tial	Commer- cial	Indus- trial	Residen- tial	Commer- cial	Indus- trial
	(acres)			(acres)		
Edmonton*	4.22	0.67	1.18	2.27	0.36	0.64
Calmar	6.91	0.52	2.09	7.72	0.58	2.33
Devon	5.09	0.41	9.51	2.52	0.20	4.60
Fort Saskatchewan	3.64	0.50	3.82	1.07	0.15	1.13
Leduc	5.30	0.74	2.04	3.99	0.56	1.53
Mayerthorpe	5.35	0.66	2.37	4.54	0.57	2.01
Morinville	6.70	1.30	3.55	5.28	1.02	2.80
St. Albert	4.83	0.38	0.65	3.31	0.22	0.45
Stony Plain	5.74	1.70	1.32	3.49	1.04	0.80
Bon Accord**	--	--	--	--	--	--
Breton	4.47	0.73	0.91	3.99	0.65	0.81
Entwistle	6.87	1.83	0.76	9.25	2.46	1.02
Gibbons	4.65	0.87	0.79	5.94	1.11	1.02
Legal	5.55	0.56	1.36	6.47	0.65	2.70
New Sarepta	7.17	1.88	2.18	5.63	1.47	1.71
Onoway	8.93	0.99	1.45	6.72	0.75	1.09
Sangudo	5.12	1.59	1.06	4.17	1.29	0.87
Spruce Grove	9.84	2.20	6.44	5.73	1.28	3.75
Thorsby	5.65	1.16	1.10	3.16	1.58	0.44
Warburg	9.24	0.76	1.01	8.26	0.69	0.49

* projected to 1969 land-use specifications

** data not available

Source: Land data were obtained from the Provincial Planning Branch and the Edmonton Regional Planning Commission; population (1969) as established under the Municipalities Assistance Act; and equalized assessments from The Assessment Equalization Board.

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